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November 14, 1988

Intermountain Power Project  
Department of Water & Power  
City of Los Angeles  
P.O. Box 111, Room 658  
Los Angeles, CA 90051

Attn: Mr. T.H. McGuiness

Re: Intermountain Power Project  
B&W Ref: RB-614/615  
Subject: Performance Test Report

Gentlemen:

Attached is your copy of B&W's report covering performance testing of IPP, Unit #2 (Sept. 88 tests). All guarantees were met or exceeded with the exception of air resistance (note that combined air and gas resistance is lower than the sum of these guarantees). Measured efficiency exceeded the guarantee level by 0.35% and both airheater pairs (primary and secondary) passed the leakage guarantees.

Based on the attached test results and IPP's 8/24/88 memo to R.P. Siegfried, B&W requests acceptance of the Unit #2 boiler effective 10/1/88 (tests were completed in September). Please advise your concurrence.

Very truly yours,

*C. A. Palmberg*  
C. A. Palmberg  
Contract Manager

CAP:ink

cc: RW Dutton - B&V w/attach.  
RK Krikorian - IPP LA w/attach. (2)  
GT Rose - IPP Delta w/attach.

INTERMOUNTAIN POWER PROJECT			
File 9255 62.3401.02			
7-16-88 BSY		1.4 FRITZ	
R. W. DUTTON			
P. F. BANNISTER			
L. ISERNHAGEN			
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IPP			
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INTERMOUNTAIN POWER PROJECT  
UNIT #2 - RB-615

PERFORMANCE TESTS - SEPTEMBER 1988

OVERVIEW

Boiler performance tests were conducted on Unit No. 2 from September 16 through September 26, 1988, to determine if this unit is operating as guaranteed. B&W Denver Service was contracted to perform the tests, with assistance from IPP personnel. The items of concern for guarantee purposes at 6,100 Mlbs/hr main steam flow are as follows:

1. Unit Efficiency - not less than 88.57 percent.
2. Main Steam Temperature - 1005 Deg F +/- 10 Deg F.
3. Reheat Temperature - 1005 Deg F +/- 10 Deg F.
4. Pressure Drop (Drum to Superheat Outlet) - Not to exceed 160 PSI.
5. Pressure Drop Reheater - Not to exceed 25 PSI.
6. Pressure Drop Economizer - Not to exceed 25 PSI.
7. Resistance AH air in to furnace - Not to exceed 5.2 Inches H2O.
8. Resistance Furnace to AH gas out - Not to exceed 7.9 Inches H2O.
9. Superheat Spray - Not to exceed 335,000 lbs/hr.
10. Reheat Spray - Not to exceed 0 lbs/hr.
11. Primary Air Heater Leakage - Not to exceed 163,000 lbs/hr.
12. Secondary Air Heater Leakage - Not to exceed 314,000 lbs/hr.
13. Excess air leaving Air Heaters - Not to exceed 27 percent.
14. NOx emissions - Not to exceed .55 Lbs/Million BTU.

Table I, on the following page, contains a summary of all guaranteed items measured during these tests, and the range of the data for each item.

All tests were conducted using composite gas sampling grids and electronic O<sub>2</sub> analyzers, as agreed to by all parties involved. Analyzer readings were verified by orsat analysis for all tests. Steam and water side pressure drops were measured using calibrated Rosemount differential pressure transmitters. Air and gas side resistances were measured by manometer. Main steam temperature, reheat temperature, and reheat spray were obtained from permanent plant instrumentation, and superheat spray quantities were calculated by heat balance using permanent plant instrumentation.

A total of eight (8) tests were conducted during the test period. Six of the tests were at full load (6,100,000 lbs/hr main steam flow) with different pulverizers out of service for each test. Test 1A was a dry run, and is included in this report for information only. In addition to the full load tests, one test was conducted at 75 % load (4,398,000 lbs/hr main steam flow), and one test was conducted at 50 % load (3,100,000 lbs/hr main steam flow). The 50 % load test was divided into two tests (7A1 and 7A2) in order to compare unit performance before and after blowing soot in the reheater.

This report will address each of the above items in the order listed above. The air heater leakage information is included for its impact on efficiency. The test procedure used to obtain the data is probably not acceptable to Air Preheater Company who is ultimately responsible for these guarantees.

GUARANTEE SUMMARY

GUARANTEED ITEM	UNITS	GUARANTEE	ACTUAL (1)	ACTUAL RANGE	REMARKS
Efficiency	%	88.57	88.92	88.70 - 89.06	Passed
SH Steam Temp.	F	995-1015	1006.8	1002 - 1008	Passed
RH Steam Temp.	F	995-1015	1009.2	1009 - 1010	Passed
SH Press. Drop	PSIG	160	157.7	156.3 - 159.1	Passed
RH Press. Drop	PSIG	25	23.5	23.0 - 23.7	Passed
* Econ Press Drop	PSIG	25	41.4	41.2 - 41.6	Passed
Air Resistance	In. WC	5.2	5.9	5.5 - 6.1	Failed
Draft Loss	In. WC	7.9	5.9	5.8 - 6.0	Passed
Total Air & Gas Resistance	In. WC	13.1	11.8	11.3 - 12.1	Passed
Superheat Spray	Klbs/hr	335	66.7	25.3 - 151.8	Passed
Reheat Spray	Klbs/hr	0	8.2	7.1 - 10.4	Passed
SH/RH Control	Klbs/hr	3965	3100	45-50 % Xair	Passed
Excess Air Lvg Air Heaters	%	27	23.9	23.4 - 24.9	Passed
Pri AH Lkg	Klbs/hr	163	148	132 - 162	Passed
Sec AH Lkg	Klbs/hr	314	245	230 - 291	Passed
NOx	Lbs/MKB	.55	.31	.25 - .44	Passed

(1) Actual column corrected to contract conditions.

\* High pressure drop must be due to a problem in one of the valves.

TABLE I

## INSTRUMENTATION AND TEST PROCEDURE

The test procedure used was in accordance with ASME PTC-4.1 Steam Generators. All flue gas analysis was conducted with multiple point, composite sampling grids and electronic analyzers for the measurement of the oxygen content of the gas. Velocity, Orsat, and temperature traverses were conducted at all gas sampling grid locations, prior to the actual tests, to verify that the arithmetic averages were the same as the velocity weighted averages at these locations. Appendix 4 contains the raw data and the comparison between arithmetic and weighted averaging for the traverses conducted. Orsats were used to verify the analyzer readings continuously. Due to the configuration of the air heater gas outlet flues, it was not possible to measure the gas leaving the secondary air heaters directly. Sampling grids were installed at the bag house inlets to obtain a total leakage for all air heaters, and at the primary air heater gas inlets and outlets to measure primary air heater leakage. The secondary air heaters were calculated by difference as explained in the section on calculation methodology.

Appendix 5 contains a drawing of each gas sampling grid installed for these tests. The number of sampling points in each gas grid are as follows:

Economizer gas outlet East side - 28 (7 wide - 4 deep)  
Economizer gas outlet West side - 28 (7 wide - 4 deep)  
Primary air heater gas inlet East - 18 (6 wide - 3 deep)  
Primary air heater gas inlet West - 18 (6 wide - 3 deep)  
Primary air heater gas outlet East - 9 (3 wide - 3 deep)  
Primary air heater gas outlet West - 9 (3 wide - 3 deep)  
Bag house inlet East - 48 (12 wide - 4 deep)  
Bag house inlet West - 48 (12 wide - 4 deep)

In addition to the flue gas sampling grids, the following temperature grids were installed on the air side of the air heaters:

Primary air heater air in East - 8 (4 wide - 2 deep)  
Primary air heater air in West - 8 (4 wide - 2 deep)  
Secondary air heater air in East - 8 (4 wide - 2 deep)  
Secondary air heater air in West - 8 (4 wide - 2 deep)  
Primary air heater air out East - 15 (5 wide - 3 deep)  
Primary air heater air out West - 15 (5 wide - 3 deep)

Plant instrumentation was used to measure the air temperature leaving the secondary air heaters.

Water manometers were installed between the secondary air heater inlets and the furnace, and between the furnace and secondary air heater gas outlets to determine if the unit is meeting the air and gas side pressure drop guarantees. In addition, manometers were installed to measure pressure differentials at the following locations:

Air in to gas out differential - Primary air heaters  
Air in to gas out differential - Secondary air heaters  
Air side differential - Primary air heaters  
Air side differential - Secondary air heaters  
Gas side differential - Primary air heaters  
Gas side differential - Secondary air heaters  
Primary air flow to each mill

The primary air flow differentials were used to calculate primary air flow as a check on the plant instrumentation. The air in to gas out differentials were used to correct air heater leakage values to contract conditions.

In order to accurately measure water and steam side pressure drops, Rosemount differential transmitters were installed in the locations listed below.

Economizer Inlet to drum  
Drum to secondary superheater outlet  
Reheat inlet to reheat outlet

Coal and ash samples were obtained by IPP personnel during the tests. Samples were collected from two different mills every half hour during the test periods. Ash and fuel analysis were also conducted by IPP. A table showing the average fuel analysis used for each test is shown in Appendix 7.

All other data necessary to determine unit output and efficiency was collected from the plant computer. Data was obtained at five (5) minute intervals and passed to the diagnostic System 140 every ten minutes for complete performance calculations and storage.

#### DATA REDUCTION AND CALCULATION METHODOLOGY

Unit efficiency was calculated in accordance with ASME PTC-4.1 Heat Loss Method, Abbreviated Form. Excess airs were determined from measured O<sub>2</sub> and the test fuel analysis in accordance with ASME PTC-19.10 Flue And Exhaust Gas Analysis. The key measurement points for determining efficiency by the heat loss method are average air temperature entering the unit and average gas temperature and excess air leaving the unit. The average air temperature entering the unit is a weighted average of the air temperature entering the primary and secondary air heaters. The method for determining the primary/secondary air splits is described below. The average gas temperature and excess air leaving the unit is a composite sample of the gas entering the bag house, which is a mix of the gas leaving the primary and secondary air heaters. This is an ideal arrangement for measuring unit efficiency. Flue gas sampling at the economizer outlet along with the bag house inlet enables calculation of total air heater leakage with a high confidence level.

In order to evaluate individual air heater performance and leakage, it is desirable to measure the conditions at the gas and air inlets and outlets of each air heater. Due to the duct arrangement of this unit, it was not possible to measure the excess air or gas temperature leaving the secondary air heaters directly. Therefore, it was necessary to calculate the secondary air heater gas outlet conditions based on the primary air heater gas outlet and bag house gas inlet conditions. The method used to calculate air and gas splits to the primary and secondary air heaters, and to determine the secondary air heater gas outlet conditions is as follows.

The total gas mass flow leaving the economizer and entering the bag house was calculated stoichiometrically based on the flue gas analysis and the fuel input. Fuel input was calculated based on the measured unit output and the unit efficiency determined as described above. Air flow through the primary air heater was calculated by heat balance using measured primary air

flow to the pulverizers, hot and cold primary air temperatures, and mill inlet temperatures. Using this calculated primary air flow and the primary air heater gas side data, the gas flow through the primary air heater was calculated by heat balance. The gas flow entering the secondary air heaters was then calculated by the difference between total gas mass flow leaving the economizer and gas flow entering the primary air heaters.

The secondary air heater leakage was calculated by the difference between total air heater leakage as calculated above and primary air heater leakage as calculated from the primary air heater gas inlet and outlet data and gas mass flow entering the primary air heater from above. Knowing the secondary air heater leakage, gas temperature leaving the primary air heater, average gas temperature leaving all air heaters, and the gas mass flows, it is possible to calculate the average gas temperature leaving the secondary air heaters. A detailed description of this calculation procedure and calculations are contained in Appendix 8.

For the efficiency calculations, the total air flow was calculated stoichiometrically assuming a setting infiltration of two (2) percent. Secondary air flow is the difference between total air flow and measured primary air flow entering the pulverizers. The primary/secondary air flow split is needed to determine the average air temperature entering the unit, and is not a critical value.

#### TEST RESULTS

The results of the tests will be discussed in the order they appear in the overview. Appendix 1 contains a listing of all test data obtained during the test period. The eight tests conducted were numbered in the following manner:

TEST No.	DESCRIPTION
1A	Dry Run - top front mill out of service (E mill)
2A	Full load - top rear mill out of service (D mill)
3A	Full load - top front mill out of service (E mill)
4A	Full load - 2nd row front mill out of service (F mill)
5A	Full load - 3rd row rear mill out of service (H mill)
6A	Full load - Lower rear mill out of service (G mill)
7A1	50 % load - 3,100 Mlbs/hr before sootblowing (E,H,C,B off)
7A2	50 % load - 3,100 Mlbs/hr after sootblowing (E,H,C,B off)
8A	75 % load - 4,400 Mlbs/hr (H,C,B off)

Some items of note regarding the testing will be discussed here.

During combustion optimization prior to testing, a problem with the Merrick feeders was discovered which causes the feeders to overload intermittently. Because of this problem, there were some problems with CO being generated during the tests. Tests 6A and 8A are the only tests that CO averaged more than 100 ppm. The average CO values for these two tests were 125 ppm and 311 ppm respectively.

After completion of the dry run (test 1A), it became obvious that the fuel being burned had significantly different slagging characteristics than the fuel burned during the tests on Unit #1. For this reason, all parties agreed to a revised sootblowing schedule for the remainder of the testing.

This schedule allowed sootblowing to within one half hour of the start of a test, and during a test if absolutely necessary. Appendix 10 contains a summary of what sootblowing was performed prior to each test. The only test that required sootblowing during the test period was test 6A (lower mill out of service). It was necessary to blow the two lower secondary superheater inlet blowers about halfway through the test, in order to avoid the use of reheat spray.

Prior to testing, a leak developed in one of the secondary superheater outlet safety valves. The decision was made to leave the unit on line until the scheduled outage, and to try to conduct the tests with valve leaking. It was not possible to estimate the amount of leakage that was occurring. However, the results of the tests are consistent with the unit #1 tests, which would indicate that the leak was not significant.

As a result of the leak mentioned above, the customer elected to delete the 5% overpressure test from the test schedule.

The diagnostic System 140 was used during these tests. The system was originally installed to aide the service department in verifying that the data being obtained during the tests was consistent and of good quality. However, with the change in fuel, the system became an invaluable tool in helping to determine when and where to blow soot.

#### Unit Efficiency

A total of six tests were conducted at the guaranteed full load condition of 6,100 Mlbs/hr main steam flow. Test 1A was a dry run and was not used as an official test. It is included in the data because the allowable sootblowing schedules were changed as a result of this test. It also demonstrates the effect of a different fuel on overall unit performance. The data for this test is of good quality but the test was considered to be a dry run due to the inability to control reheat temperature without spray. Table II shows the efficiency for all of the full load tests corrected to contract conditions.

Test No.	2A	3A	4A	5A	6A
Efficiency	89.03	88.70	88.83	89.06	88.97

TABLE II - EFFICIENCY SUMMARY

The guaranteed efficiency of 88.57 percent was exceeded for all test conditions. The average efficiency for all of the tests conducted was 88.92 percent. Appendix 2 contains a summary of the unit efficiency calculations for all tests conducted. A summary of the total unit output calculations is contained in Appendix 3. The calculations for unburned carbon used in the efficiency calculations are shown in Appendix 7, with the average fuel analysis listing.

### Superheat and Reheat Outlet Temperatures

Tests were conducted with several pulverizer configurations to verify that superheat temperature could be maintained at 1005 degrees F. Tests were also conducted at 75 and 50 percent load to verify that reheat temperature could be maintained at 1005 degrees F over the guaranteed load range. The 50 percent load test was conducted with a main steam flow of 3,100 Mlbs/hr, which was well below the guaranteed flow of 3,965 Mlbs/hr. This test was divided into two tests to demonstrate that reheat temperature could be obtained at this load. With an excess air of 44 percent the reheat temperature was 993 degrees F, even with a top mill out of service and a clean furnace. This would indicate that reheat temperature could be maintained with an excess air of between 45 and 50 percent even with an unfavorable operating configuration. Test 7A2 is data obtained after blowing soot in the reheater in an effort to raise steam temperatures. When the pendant reheat section was blown the secondary superheater was partially cleaned which caused the reheat temperature to sag. Table III shows the superheat and reheat temperatures obtained for each test, along with the corresponding spray quantities. The data demonstrates the units' ability to meet the temperature guarantees of 1005 degrees F +/- 10 degrees F for virtually all operating conditions.

Test No.	Superheat	Reheat	Superheat		Reheat	
	Temperature	Temperature	Spray	Spray	Meas.	Calc.
	F	F	Mlbs/hr	Mlbs/hr	Meas.	Calc.
1A	1006.8	1017.3	46.8	62.5	33.8	92.3
2A	1002.5	1008.7	10.0	35.2	8.7	6.6
3A	1008.7	1009.6	42.9	65.7	7.1	7.5
4A	1008.5	1009.6	114.2	140.4	7.1	8.5
5A	1008.7	1009.6	43.6	72.6	8.6	9.1
6A	1008.5	1009.6	67.2	88.6	10.4	9.2
7A1	999.8	993.2	6.3	26.9	7.9	3.0
7A2	1002.1	964.9	7.2	25.3	7.9	3.0
8A	1006.9	1013.2	136.6	151.8	7.9	4.3

TABLE III - STEAM TEMPERATURES AND SPRAY FLOW SUMMARY

### Superheat and Reheat Spray Quantities

The guaranteed value for superheat spray was not to exceed 335,000 lbs/hr for a spray water temperature of 390 degrees F or less. All test results show that this guarantee is being met easily.

The guarantee specifies a reheat spray of zero, do to the ability to control gas flow to make reheat. Table III shows a comparison of measured versus calculated reheat spray flow quantities. The thermocouples before and after the reheat attemperator were in working order, and show a reasonable reheat spray by heat balance. The reheat spray was negligible for all tests except 1A. Therefore, this guarantee item is considered to be met.

### Economizer Pressure Drop

The pressure drop through the economizer, not including valves or static head, was guaranteed not to exceed 25 psi. The test connection at the economizer inlet was located upstream of the stop and check valves. The pressure drop from the manufacturer for the stop valve is 2.7 psi and 7.0 psi for the check valve. The static head was calculated based on the average specific volume between the inlet and outlet conditions. The cold leg was calculated based on the specific volume at 90 degrees F and the outlet pressure. The data was also corrected for the difference between actual and guaranteed flows by the square of the ratio of the flows. Table IV summarizes the pressure drop calculations. The actual calculations can be seen in Appendix 6. The average pressure drop for all tests conducted was 41.43 psi. The high pressure drop must be the result of one of the valves malfunctioning. It is not physically possible for two identical economizers to have this large a difference in pressure drop. Since the pressure drop on Unit #1 was well below the guaranteed value, B&W considers this guarantee to be met. If this is not acceptable, then a retest should be conducted with a pressure tap installed downstream of the valves, to eliminate them as a possible source of error.

Test No.	Actual Reading	Corrected for Static Hd (98.50')	Corrected for Valves	Corrected for Flow Diff.
		Cold Leg (110.3')		
2A	34.95	51.28	41.58	41.16
3A	34.94	51.27	41.57	41.59
4A	34.07	50.40	40.70	41.55
5A	34.23	50.56	40.86	41.27
6A	34.53	50.68	40.98	41.60

TABLE IV - SUMMARY OF ECONOMIZER PRESSURE DROP CALCULATIONS

### Reheater Pressure Drop

The pressure drop from the reheater inlet to B&W's termination point at the reheater outlet was guaranteed not to exceed 25 psi. The test connection at the reheater outlet was installed 19.0 ft. downstream of the last bend in the piping. Corrections were made to the readings to account for losses in the customer piping for two bend losses, friction loss, and transition loss due to a diameter change. The cold leg correction was based on the specific volume at 90 degrees F and outlet pressure. The readings were also corrected for the difference between actual and guarantee flow by the ratio of the square of the flows. Table V shows a summary of the pressure drop calculations. The actual calculations are contained in Appendix 6. The average pressure drop for all of the tests was 23.5 psi. The expected transmitter error is 0.1 psi.

Test No.	Actual Reading	Corrected for Cold Leg (116')	Corrected for Cust. Piping	Corrected for Flow Diff.
2A	-24.54	25.58	24.42	23.59
3A	-24.47	25.65	24.50	23.63
4A	-24.49	25.63	24.45	23.03
5A	-24.72	25.40	24.24	23.52
6A	-24.54	25.40	24.24	23.52

TABLE V - SUMMARY OF REHEATER PRESSURE DROP CALCULATIONS

Superheater Pressure Drop

The pressure drop from the drum to B&W's terminal point at the superheater outlet was guaranteed not to exceed 160 psi. The test connection at the superheater outlet was installed 1.0 ft downstream of the two bends in the superheater outlet piping. Corrections were made to the readings to account for losses in the customer piping for two bends, friction losses, and a transition loss due to a change in pipe diameter. The cold leg correction was based on the specific volume at 90 degrees F and outlet pressure. The readings were also corrected for the difference between actual and guarantee flows by the square of the ratio of the flows. Table VI shows a summary of the pressure drop calculations. Once again, the calculations are contained in Appendix 6. The average pressure drop for all of the tests is 157.7 psi. The expected transmitter error is +/- .75 psi.

Test No.	Actual Reading	Corrected for Cust. Piping	Corrected for Cold Leg (5.5')	Corrected for Flow Diff.
2A	167.5	159.24	161.62	158.12
3A	168.3	160.07	162.45	159.10
4A	166.2	157.92	160.30	156.29
5A	165.8	157.61	159.99	157.81
6A	165.4	157.21	159.59	157.37

TABLE VI - SUMMARY OF SUPERHEATER PRESSURE DROP CALCULATIONS

Air and Gas Resistance

An average net resistance from the air heater air inlet to the furnace of 5.2 inches of water and from the furnace to the air heater gas outlet of 7.9 inches of water were guaranteed on this contract. The test readings were corrected for the difference between guarantee and actual air and gas flows by the square of the ratio of the flows. Table VII contains a summary of the air and gas resistance corrections. Appendix 6 contains the actual correction calculations. The average air side resistance for all tests was 5.9 inches of water. The average gas side resistance was 5.9 inches of water. While the air side resistance is .7 inches higher than guaranteed, the draft loss is 2 inches less than guaranteed which makes the total resistance well below the guaranteed value. The secondary air dampers were set at 67 percent for the tests which explains the high air side resistance. If these dampers were at

or near full open the air resistance would be reduced significantly. For this reason, and the low overall resistance, this guarantee is considered to have been met.

Test No.	AIR SIDE RESISTANCE		GAS SIDE RESISTANCE		Air in to Gas
	Actual Reading	Corrected for Flow	Actual Reading	Corrected for Flow	Out Diff. Test
2A	5.85	5.90	6.32	5.95	12.1
3A	6.15	5.95	6.45	5.91	12.6
4A	5.95	5.54	6.45	5.81	12.4
5A	5.85	5.82	6.25	5.99	11.9
6A	5.95	6.08	6.25	5.99	12.2

TABLE VII - SUMMARY OF AIR AND GAS RESISTANCE CALCULATIONS

Primary and Secondary Air Heater Performance

The air heater guarantees for this unit are the responsibility of the Air Preheater Company. The results contained in this report are supplied for information only. The guaranteed leakages for the primary and secondary air heaters are 163,000 lbs/hr and 314,000 lbs/hr respectively. Table VIII contains a summary of the calculated air heater leakages, and the values of primary and secondary leakage corrected for air in to gas out differential pressure based on ASME PTC-4.3 Air Heater Test Code. The calculations for air heater leakage corrections are contained in Appendix 6. The actual excess air leaving the air heaters and the excess air leaving the air heaters corrected for excess air leaving the economizer are also included for each test. Both the secondary and primary air heaters are well within the guaranteed values for air heater leakage.

Test No.	Primary Leakage		Secondary Leakage		Total Leakage Mlbs/hr	Excess Air Leaving AH's Percent	Excess Air Lvg AH's Corr. For	Excess Air Economizer
	Uncorr.	Corr.	Uncorr.	Corr.				
2A	142	132	229	237	368	22.7		23.4
3A	176	162	287	291	453	24.8		24.9
4A	161	148	227	232	380	24.5		23.7
5A	158	145	222	230	375	23.4		23.6
6A	164	151	230	237	388	23.2		23.9
AVERAGE	160	148	239	245	392	23.7		23.9

TABLE VIII - SUMMARY OF AIR HEATER LEAKAGE INFORMATION

### Excess Air Leaving Air Heaters

The excess air leaving the air heaters was guaranteed not to exceed 27 percent. The average value of excess air leaving the air heaters was 23.7 percent for these tests. When corrected to the design economizer excess air of 17 percent, the average value of excess air leaving the air heaters is 23.9 percent. This is well within the guaranteed limit. The accepted error for the instruments used to measure O<sub>2</sub> is +/- 0.1 % O<sub>2</sub>. This corresponds to 1 percent excess air.

All measurements were obtained using continuous monitoring analyzers, and were verified with orsats at fifteen minute intervals. Appendix 9 contains plots of the average analyzer readings versus the average orsat readings at each location, for all tests.

### NOx Emissions

The guaranteed value of NOx for this unit is .55 lbs/MKB. NOx was converted from parts per million to pounds per million BTU using the following equations from EPA Method 7.

$$E = PPM \times C \times F \times 20.9 / (20.9 - O_2\% \text{ in flue gas})$$

Where:

E = Emissions in pounds per million BTU

C = 2.59E-9 \* 46.01 (MW of NOx = 46.01)

$$F = \frac{10E6 * (3.64 * H\% + 1.53 * C\% + .57 * S\% + .14 * N\% - .46 * O_2\%)}{HHV}$$

Table IX shows a summary of the NOx values as measured, converted to lbs/MKB, and corrected to 0 percent excess air. The average NOx emissions for all full load tests was 0.31 lbs/MKB which is easily within the guaranteed limits.

Test No.	NOx Reading PPM	NOx Lbs/MKB	NOx Lbs/MKB Corr. to 0 % Excess Air
2A	328.5	.38	.44
3A	249.8	.29	.34
4A	270.8	.32	.38
5A	234.7	.27	.32
6A	204.3	.24	.28
7A1	156.3	.18	.26
7A2	152.6	.18	.25
8A	179.9	.21	.25

TABLE IX - SUMMARY OF NOX EMISSIONS

### Expected Air Heater Exit Temperature

The design target value for temperature entering the bag house was 280 degrees F (uncorrected for leakage). Table X contains a summary of the measured inlet temperatures, temperatures excluding air heater leakage, and temperatures corrected to design air heater entering temperature.

Test No.	Measured Temperature	Corrected For AH Ent. Temp.	Corrected For Ent. Temp & Excluding Leakage
2A	289.8	286.0	300.2
3A	299.5	295.2	312.8
4A	294.2	290.9	305.1
5A	286.0	284.6	296.6
6A	294.3	288.0	305.3

TABLE X - AIR HEATER EXIT TEMPERATURE SUMMARY

CONCLUSIONS

The guarantees for this unit have been met or exceeded with the exception of the economizer pressure drop and air side resistance. The economizer pressure drop is almost twice what it was for the unit #1 tests, which would indicate that something is wrong with either the stop or check valve. The high air side resistance was caused by throttling the secondary air dampers down to 67 %. Opening these dampers should bring the pressure drop within the guaranteed limits, and the draft loss is low enough to make the total resistance acceptable.

ATTACHMENTS

- 1 - DATA LISTING
- 2 - EFFICIENCY CALCULATIONS - INDIVIDUAL AIR HEATER BASIS
- 3 - BOILER OUTPUT CALCULATIONS
- 4 - GAS SAMPLING GRID TRAVERSE DATA
- 5 - GAS SAMPLING GRID SKETCHES
- 6 - PRESSURE DROP, AIR RESISTANCE, AND DRAFT LOSS CALCULATIONS
- 7 - AVERAGE FUEL ANALYSIS AND CARBON LOSS CALCULATIONS
- 8 - AIR AND GAS FLOW CALCULATION METHODOLOGY
- 9 - ORSAT VERSUS ANALYZER COMPARISON
- 10 - SOOTBLOWING SUMMARY SHEETS

**IP14\_000654**

**APPENDIX 1**

**DATA LISTING**

**IP14\_000655**

RB-614

11 Oct 1988

07:38:49

TEST NO.	1A	2A	3A	4A	5A	6A	8A	7A1	7A2	1
TEST SEQ. NO.	1	2	3	4	5	6	7	8	9	10
DATE	16Sep88	19Sep88	20Sep88	21Sep88	22Sep88	23Sep88	26Sep88	26Sep88	26Sep88	13Jun88
TIME START	1155	1025	1320	1045	1005	1025	0515	2355	0240	1055
TIME END	1605	1530	1715	1435	1415	1435	0715	0040	0355	1405
LOAD MW	850	850	846	850	847	849	646	433	435	851
FUEL										
ALPHA1										
ALPHA2										

1A AVERAGE OF SCANS 18 ---->41, FULL LOAD E MILL OFF  
 2A AVERAGE OF SCANS 8 ----> 33, FULL LOAD, D MILL OFF  
 3A AVERAGE OF SCANS 61 ----> 82, FULL LOAD, E MILL OFF  
 4A AVERAGE OF SCANS 13 ----> 34, FULL LOAD F MILL OFF  
 5A AVERAGE OF SCANS 9 ----> 33, FULL LOAD H MILL OFF  
 6A AVERAGE OF SCANS 14 ----> 38, FULL LOAD G MILL OFF  
 8A AVERAGE OF SCANS 31 ----> 42, 75% LOAD B,C,H MILLS OFF  
 7A1 AVERAGE OF SCANS 4 ---->7, LOW LOAD BEFORE SOOTBLOWING  
 7A2 AVERAGE OF SCANS 20---->24, LOW LOAD AFTER SOOTBLOWING  
 1 AVE. TESTS 11 -->29 FULL LOAD D MILL OUT, 19% EXCESS AIR

DATA PAGE NO. 2 FLOWS MLB/HR (MT/HR)

LOAD MW	XI027A	850.4	849.7	846.4	850.1	847.0	848.9	645.7	432.9	435.2	850.6	2	1
HP STEAM FLOW	XI023A	6086.9	6143.7	6120.4	6084.4	6089.7	6082.5	4316.9	2961.0	2977.6	6024.2	2	2
FW FLOW	XI021A	6064.1	6131.9	6098.1	6037.5	6069.5	6054.2	4259.2	2949.6	2966.8	6008.4	2	3
BLOW DOWN FLOW		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	4
RH-1 SP FLOW	FT0020	33.79	8.66	7.07	7.07	8.65	10.39	7.91	7.91	7.91	10.00	2	5
SH-1 SP FLOW	W XI097A	17.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2	7
SH-1 SP FLOW	E XI096A	16.80	10.01	9.50	9.85	9.44	8.86	8.60	6.31	7.23	10.18	2	8
SH-2 SP FLOW	W XI092A	4.93	0.00	21.44	52.28	16.66	29.11	63.99	0.00	0.00	13.71	2	9
SH-2 SP FLOW	E XI091A	7.16	0.00	22.00	52.04	17.50	29.14	63.96	0.00	0.00	15.79	2	10
TOTAL AIR FLOW	XI078A	72.96	71.63	72.97	73.57	72.37	71.78	57.78	49.51	46.72	73.70	2	18
TOTAL FUEL FLOW	XI001A	334.4	323.2	326.9	326.5	326.4	327.5	246.2	176.6	175.3	322.2	2	19
FEGT - PYROSONICS	TG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2	20

DATA PAGE NO. 3 FLUID TEMPERATURES F (C) - PLANT

SSH OUT T (P)	TE0002	1006.8	1002.5	1008.7	1008.5	1008.7	1008.5	1006.9	999.8	1002.1	1009.2	3	1
TURB THROT T (P)	XI015A	1003.2	998.8	1005.2	1005.0	1005.1	1005.0	1004.8	998.3	1000.6	1005.8	3	3
ECON IN T (P)	XI025A	549.0	548.2	548.9	549.3	548.3	548.6	515.1	473.7	474.7	544.0	3	5
SH-1 SPRAY TEMP	TE0991	344.4	337.3	343.4	337.0	342.5	343.4	320.8	308.4	289.6	341.4	3	7
LVG 1st STG ATT(P)-W	TE0866	718.8	715.2	719.1	720.9	716.6	718.5	701.3	701.7	695.6	713.8	3	8
LVG 1st STG ATT(P)-E	TE0865	718.0	711.0	717.6	716.6	718.3	713.9	702.7	703.3	697.6	712.8	3	9
ENT 1st STG ATT(P)-W	TE0864	723.6	716.9	719.9	723.1	717.6	719.3	703.5	704.9	697.8	712.8	3	10
ENT 1st STG ATT(P)-E	TE0863	721.7	712.9	719.7	719.4	721.8	716.4	704.2	703.6	698.2	711.4	3	11

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TEST NO.	1A	2A	3A	4A	5A	6A	8A	7A1	7A2	1
TEST SEQ. NO.	1	2	3	4	5	6	7	8	9	10
DATE	16Sep88	19Sep88	20Sep88	21Sep88	22Sep88	23Sep88	26Sep88	26Sep88	26Sep88	13Jun88
TIME START	1155	1025	1320	1045	1005	1025	0515	2355	0240	1055
TIME END	1605	1530	1715	1435	1415	1435	0715	0040	0355	1405
LOAD MW	850	850	846	850	847	849	646	433	435	851

DATA PAGE NO. 3      FLUID TEMPERATURES F (C) - PLANT

LVG RH-1 T (P)-N	TE0011	1015.8	1007.8	1008.6	1008.5	1008.2	1008.5	1013.3	994.0	965.5	1006.1	3 12
LVG RH-1 T (P)-S	TE0015	1018.8	1009.5	1010.5	1010.7	1011.0	1010.8	1013.0	992.5	964.3	1007.6	3 13
HRH AT TURB (P)-N	TE0013	1013.8	1006.0	1007.0	1006.7	1006.7	1006.8	1011.4	992.5	964.2	1004.4	3 14
HRH AT TURB (P)-S	TE0016	993.8	1005.5	1006.5	1006.6	1006.8	1006.6	1008.8	988.5	960.6	1003.5	3 15
ENT RH-1 T (P)	XI107A	596.3	616.7	622.2	622.0	621.1	621.6	581.3	541.2	541.5	624.5	3 16
CRH ENT ATT (P)	TE0024	625.0	619.3	625.2	625.4	624.3	624.8	583.7	543.7	544.0	627.7	3 18
RH DSUPHTR INL T (P)	XI106A	621.8	616.5	622.0	621.8	620.9	621.4	581.1	541.1	541.3	624.3	3 19
RH-1 SPRAY T (P)	TE0060	338.5	95.8	95.9	92.3	248.1	246.8	106.7	111.9	108.8	277.0	3 20
LVG 2nd STG AT (P)-W	TE0873	776.5	778.7	779.3	773.3	773.7	778.0	747.7	761.7	754.6	779.4	3 21
LVG 2nd STG AT (P)-E	TE0874	770.9	766.4	768.5	762.5	779.2	763.7	746.6	763.4	757.1	773.2	3 22
ENT 2nd STG AT (P)-W	TE0871	778.1	780.3	786.3	791.2	780.4	788.4	776.5	766.3	758.8	782.0	3 23
ENT 2nd STG AT (P)-E	TE0872	773.8	768.7	776.1	778.2	786.7	773.9	772.3	769.6	763.2	776.3	3 24
ECON OUT T (P)	TE0861	575.0	571.9	574.5	575.1	574.5	573.6	539.2	506.2	504.5	567.6	3 27
ECON OUT T (P)	TE0862	584.7	582.2	584.7	585.0	583.5	583.6	549.7	520.4	517.8	577.6	3 28
SAT CON TUBE(P)	TE0448	676.6	676.9	676.7	676.6	676.6	676.6	669.8	665.3	665.8	675.7	3 29

DATA PAGE NO. 5      FLUID PRESSURES PSIG (KG/CM2)

SEC SH OUT PRESS (P)	PT0001	2406.3	2407.3	2403.1	2403.9	2404.5	2405.4	2404.4	2400.0	2406.1	2397.0	5 2
DRUM PRESS (P)	XI043A	2629.2	2632.8	2629.1	2629.0	2627.9	2627.9	2508.3	2432.7	2440.2	2615.4	5 3
HRH RH-1 PRESS (P)	KV0015	507.7	502.9	505.2	504.8	500.8	502.1	372.1	250.7	251.5	507.3	5 4
CRB RH-1 PRESS (P)	PT0012	548.1	543.0	545.3	545.1	540.6	542.1	402.5	271.0	271.6	547.9	5 5
NO. 1 HTR EXT P (P)-A	PT0021	1036.0	1031.4	1038.3	1036.8	1025.5	1031.4	754.5	506.7	510.5	1041.6	5 6
NO. 1 HTR EXT P (P)-B	PT0022	1047.3	1043.0	1049.9	1048.4	1035.4	1042.5	764.7	514.6	518.9	1051.6	5 7
NO. 2 HTR EXT P (P)-A	PT0019	533.3	528.4	530.7	530.6	526.1	527.6	392.0	263.6	264.1	533.2	5 8
NO. 2 HTR EXT P (P)-B	PT0020	533.0	528.2	530.4	530.4	526.2	527.4	392.0	263.7	264.2	532.9	5 9
ECON IN PRESS (P)	PT0032	2759.3	2725.4	2760.8	2758.6	2757.9	2758.2	2614.6	2526.9	2535.1	2740.5	5 12
SEC SH IN PRES (P) E	PT0198	2559.8	2560.5	2558.7	2558.3	2557.0	2558.3	2476.5	2423.3	2430.1	2543.5	5 13
SEC SH IN PRES (P) W	PT0199	2555.2	2555.9	2554.0	2553.9	2552.5	2553.7	2471.6	2418.4	2425.1	2539.3	5 14
ECON DIFF PRES (B)	ROSEDP	34.23	34.95	34.94	34.07	34.23	34.35	11.72	1.41	1.61	29.40	5 15
RH DIFF PRES (B)	ROSEDP	24.50	24.54	24.47	24.49	24.72	24.54	30.71	36.66	36.55	24.17	5 29
SH DIFF PRES (B)	ROSEDP	166.8	167.5	168.3	166.2	165.8	165.4	84.8	36.6	37.3	164.6	5 30

DATA PAGE NO. 6      AIR & GAS DATA - PLANT

AMBIENT AIR TEMP	KK0531	103.0	103.0	68.4	67.3	68.4	70.2	64.5	65.2	65.2	69.8	6 1
AIR ENT SEC AH (P)-A	TE0938	85.98	68.19	69.68	68.32	64.75	72.09	69.96	71.82	71.48	78.72	6 2
AIR ENT SEC AH (P)-B	TE0940	83.25	66.55	67.29	65.32	62.18	69.81	67.54	69.64	69.17	75.23	6 3
AIR ENT PRI AH (P)-A	TE0911	107.8	89.7	91.3	89.4	86.7	94.1	95.0	100.2	99.7	101.5	6 4
AIR ENT PRI AH (P)-B	TE0912	108.6	88.5	89.7	88.7	86.6	94.4	96.0	102.2	101.5	100.3	6 5
AIR LVG SEC AH (P)-A	XI149A	643.3	628.9	637.2	629.5	624.4	632.2	601.7	574.4	557.8	624.6	6 6
AIR LVG SEC AH (P)-B	XI150A	649.3	633.3	640.4	634.2	633.7	637.6	605.7	575.0	563.0	631.7	6 7
AIR LVG PRI AH (P)-A	TE0917	516.5	522.3	521.8	519.6	513.7	516.7	511.3	498.6	491.8	514.9	6 8

TEST NO.	1A	2A	3A	4A	5A	6A	8A	7A1	7A2	1
TEST SEQ. NO.	1	2	3	4	5	6	7	8	9	10
DATE	16Sep88	19Sep88	20Sep88	21Sep88	22Sep88	23Sep88	26Sep88	26Sep88	26Sep88	13Jun88
TIME START	1155	1025	1320	1045	1005	1025	0515	2355	0240	1055
TIME END	1605	1530	1715	1435	1415	1435	0715	0040	0355	1405
LOAD MW	850	850	846	850	847	849	646	433	435	851

DATA PAGE NO. 6 AIR & GAS DATA - PLANT

AIR LVG PRI AH (P)-B	TE0918	526.0	534.1	534.0	531.1	527.3	531.4	535.0	519.6	507.4	518.8	6 9
GAS LVG SEC AH (P)-A	TE0927	298.0	288.4	290.7	288.0	285.4	289.6	277.5	265.9	263.9	290.3	6 10
GAS LVG SEC AH (P)-B	TE0929	313.9	297.3	304.4	297.0	288.4	300.1	270.8	252.0	242.4	303.4	6 11
GAS LVG PRI AH (P)-A	TE0913	295.2	295.4	294.3	294.8	292.3	293.5	291.8	283.4	285.3	289.2	6 12
GAS LVG PRI AH (P)-B	TE0916	320.7	321.2	319.4	320.0	323.3	324.2	333.2	314.9	315.5	306.0	6 13
GAS LVG ECON (P)-E	TE0707	731.5	732.9	727.1	718.5	724.6	730.7	712.4	670.3	655.6	727.6	6 14
GAS LVG ECON (P)-W	TE0710	729.4	731.2	727.3	719.6	717.8	729.5	700.3	660.8	646.4	717.4	6 15
O2 LVG ECON (P)-W	AZ0023	3.0200	2.6467	2.7250	2.8993	3.1110	2.4100	3.0117	6.2438	5.3390	2.6460	6 20
O2 LVG ECON (P)-E	AZ0022	2.9056	3.4096	3.3078	3.4021	2.7976	3.6190	4.0463	6.4725	5.9050	3.2011	6 21
NOX @ STACK (P)	KK0006	257.3	284.6	269.9	260.2	239.1	210.6	195.8	160.7	156.3	227.8	6 24
O2 @ STACK (P)	KK0008	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6 25
STACK O2/CO2 (P)	KK0008	4.7623	4.7115	4.7990	4.8916	4.7910	4.9856	5.3854	8.3000	7.6820	5.6610	13 25
DRY BULB TEMP (P)	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6 26
WET BULB TEMP (P)	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6 27
BAROMETRIC PRESS (P)	PT0227	25.38	25.35	25.24	25.36	25.47	25.47	25.48	25.45	25.45	25.43	6 29
DRY BULB TEMP (B)	TC	80.15	62.58	63.38	62.56	59.16	67.19	64.77	67.67	67.05	74.74	7 26
WET BULB TEMP (B)	TC	57.87	47.40	51.45	51.49	51.13	52.53	51.33	50.47	50.20	54.85	7 27
MOIST IN AIR (B)	CALC	.0070	.0049	.0070	.0071	.0075	.0065	.0067	.0052	.0052	.0062	7 28
BAROMETRIC PRESS (B)	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7 29
REL HUMIDITY (P)	KK0530	25.00	25.00	35.64	42.98	56.69	33.52	24.41	22.27	23.09	29.64	7 30
PLANT O2 (OLD) (P) E	XI0079	3.0748	3.5713	3.0915	4.0546	3.3342	4.4454	4.3575	6.1187	5.7890	1.5158	9 29
PLANT O2 (OLD) (P) W	XI0080	1.7029	2.0927	.7988	1.8725	2.9088	1.0746	3.2288	6.8038	5.4960	1.3603	9 30
OLD PLANT O2-A(P)-1	TE0535	2.3	2.0	2.3	1.9	2.0	1.9	.7	.7	.7	893.8	9 17
OLD PLANT O2-A(P)-2	TE0536	2.5	2.2	2.5	.1	2.1	2.1	1.5	.6	.7	924.3	9 18
OLD PLANT O2-A(P)-3	TE0537	2.2	2.0	2.1	2.0	1.9	1.9	1.5	.4	.5	146.0	9 19
OLD PLANT O2-A(P)-4	TE0538	.7	1.9	.7	1.9	1.9	1.9	1.4	.7	.7	934.6	9 20
OLD PLANT O2-B(P)-1	TE0539	2.1	1.8	2.1	1.8	1.8	.7	1.2	.3	.4	906.5	9 21
OLD PLANT O2-B(P)-2	TE0540	2.3	2.1	2.3	2.0	2.0	1.9	.6	.2	.7	943.8	9 22
OLD PLANT O2-B(P)-3	TE0541	2.5	2.2	2.5	2.2	.3	2.2	.2	.4	.5	923.0	9 23
OLD PLANT O2-B(P)-4	TE0542	2.5	.4	2.5	2.1	2.0	2.1	1.6	.7	.8	960.5	9 24

DATA PAGE NO. 7 AIR & GAS DATA - B&W

AIR ENT SEC AH (B) W	GRID	85.89	67.96	68.68	66.92	63.84	71.32	68.86	70.91	70.59	77.12	7 2
AIR ENT SEC AH (B) E	GRID	85.50	67.65	68.91	67.56	64.19	71.45	69.15	70.95	70.55	78.20	7 3
AIR ENT PRI AH (B) W	GRID	107.5	89.1	88.4	87.8	85.5	93.4	94.4	100.4	99.9	99.0	7 4
AIR ENT PRI AH (B) E	GRID	106.8	88.9	90.1	88.5	85.7	93.2	93.5	98.7	98.1	100.3	7 5
AIR LVG PRI AH (B) W	GRID	523.3	531.5	530.8	528.5	524.8	528.4	532.8	513.2	503.2	519.3	7 8
AIR LVG PRI AH (B) E	GRID	516.9	523.3	523.0	521.3	514.1	517.0	514.6	501.5	495.2	518.8	7 9
GAS LVG PRI AH (B) W	GRID	300.6	300.7	298.9	299.2	301.8	303.4	313.2	299.0	298.9	287.0	7 12
GAS LVG PRI AH (B) E	GRID	303.4	303.4	301.9	302.5	300.6	301.5	299.5	293.1	294.8	297.4	7 13
GAS LVG ECON (B) W	GRID	731.3	723.4	731.1	723.4	721.9	729.0	698.8	655.3	637.0	720.7	7 14
GAS LVG ECON (B) E	GRID	735.0	725.3	728.2	721.3	723.9	727.8	696.3	654.3	644.1	724.4	7 15
GAS ENT PRI AH (B) W	GRID	721.3	714.6	715.0	707.7	708.6	714.3	683.5	645.3	629.2	711.4	7 18

TEST NO.	1A	2A	3A	4A	5A	6A	8A	7A1	7A2	1
TEST SEQ. NO.	1	2	3	4	5	6	7	8	9	10
DATE	16Sep88	19Sep88	20Sep88	21Sep88	22Sep88	23Sep88	26Sep88	26Sep88	26Sep88	13Jun88
TIME START	1155	1025	1320	1045	1005	1025	0515	2355	0240	1055
TIME END	1605	1530	1715	1435	1415	1435	0715	0040	0355	1405
LOAD MW	850	850	846	850	847	849	646	433	435	851

DATA PAGE NO. 7 AIR & GAS DATA - B&W

GAS ENT PRI AH (B) E	GRID	722.1	714.2	715.8	708.0	710.8	713.2	686.1	649.1	635.1	715.9	7 19
O2 LVG ECON (B) W	TELE	3.0816	2.5428	2.7918	2.9052	3.2279	2.3433	3.1645	6.4249	5.4881	3.6122	7 20
O2 LVG ECON (B) E	TELE	3.0561	3.4723	3.3924	3.5758	2.9371	3.6689	4.0768	6.7611	6.1568	3.1789	7 21
O2 LVG ECON (B) W	L&N	3.0816	2.5428	2.7918	2.9052	3.2477	2.3433	3.1645	6.4249	5.4881	3.6122	12 19
O2 LVG ECON (B) E	L&N	3.0561	3.4723	3.3924	3.5758	2.9517	3.6689	4.0768	6.7611	6.1568	3.1789	12 20
CO2 LVG ECON (B) W	MSA	15.86	15.93	16.16	16.24	15.74	16.65	15.94	12.64	13.66	15.47	7 22
CO2 LVG ECON (B) E	MSA	15.71	15.47	16.20	15.74	15.97	15.22	15.06	12.30	12.99	16.48	7 23
CO LVG ECON PPM E	MSA	49.4	47.9	48.1	30.3	49.2	41.6	133.7	29.2	36.0	598.3	13 26
CO LVG ECON PPM W	MSA	44.3	51.5	139.6	62.4	28.5	210.6	489.2	36.6	42.7	98.9	13 27
NOX LVG ECON (B)	CHEM	258.8	328.5	249.8	270.8	234.7	204.3	179.9	156.3	152.2	220.0	7 24

DATA PAGE NO. 8 FW HTR TEMPERATURES F (C) - PLANT

NO.1 HTR EXT T (P)-A	TE0030	794.1	789.1	796.1	796.0	794.4	795.1	742.2	691.6	693.9	797.7	8 1
NO.1 HTR EXT T (P)-B	TE0031	794.4	789.4	796.3	779.8	794.3	795.3	741.8	690.9	693.9	798.0	8 2
NO.2 HTR EXT T (P)-A	TE0028	623.1	617.3	623.2	623.1	622.3	622.6	581.8	541.7	541.8	625.5	8 3
NO.2 HTR EXT T (P)-B	TE0029	623.8	618.1	623.9	623.9	623.0	623.4	582.4	542.2	542.8	626.2	8 4
NO.1 FW LVG T (P)-A	TE0059	549.1	548.5	549.4	549.5	548.1	548.8	516.0	474.6	475.7	550.8	8 5
NO.1 FW LVG T (P)-B	TE0154	549.4	549.0	549.3	538.7	549.7	549.5	516.0	474.1	475.1	552.4	8 6
NO.1 FW ENT T (P)-A	TE0055	475.2	474.0	474.7	474.8	473.8	474.2	446.2	410.3	410.6	476.5	8 7
NO.1 FW ENT T (P)-B	TE0056	467.8	475.6	476.2	476.4	475.2	475.7	447.9	412.1	412.3	478.0	8 8
NO.2 FW ENT T (P)-A	TE0053	393.4	392.1	392.6	392.6	392.0	392.2	370.2	341.0	340.8	393.8	8 11
NO.2 FW ENT T (P)-B	TE0054	393.7	392.3	392.9	392.9	392.2	392.5	370.4	341.4	341.1	394.1	8 12
NO.1 DRAIN T (P)-A	TE0185	484.4	483.5	484.2	484.3	483.2	483.5	452.5	368.1	415.2	483.5	8 13
NO.1 DRAIN T (P)-B	TE0186	486.8	486.6	485.1	487.2	510.4	487.0	454.3	415.3	415.7	487.1	8 14
NO.2 DRAIN T (P)-A	TE0183	402.9	401.8	402.2	402.3	401.6	401.9	377.1	346.5	346.2	402.8	8 15
NO.2 DRAIN T (P)-B	TE0184	402.2	401.0	401.5	401.6	400.8	401.1	376.6	345.6	345.4	402.4	8 16
INT SSH MANIF (P)-1	TE0521	902.7	891.6	884.0	867.0	866.6	868.5	848.2	865.2	846.8	906.5	8 17
INT SSH MANIF (P)-2	TE0522	937.1	929.7	924.6	912.2	906.2	909.9	898.4	913.6	901.1	963.8	8 18
INT SSH MANIF (P)-3	TE0523	930.3	926.9	917.4	916.5	913.7	916.3	894.9	910.2	908.9	947.8	8 19
INT SSH MANIF (P)-4	TE0524	935.1	930.4	920.0	926.2	918.3	926.2	897.2	904.4	911.3	938.2	8 20
INT SSH MANIF (P)-5	TE0525	937.5	934.6	922.8	929.9	920.7	930.6	903.0	906.8	911.8	928.1	8 21
INT SSH MANIF (P)-6	TE0526	938.7	937.0	926.0	925.3	925.6	927.6	907.2	912.5	912.4	917.0	8 22
INT SSH MANIF (P)-7	TE0527	944.6	946.7	934.5	926.6	934.7	929.8	924.3	926.0	918.3	919.7	8 23
INT SSH MANIF (P)-8	TE0528	916.6	919.6	919.8	914.8	912.4	914.3	949.7	939.3	939.5	902.1	8 24
INT SSH MANIF (P)-9	TE0529	919.2	927.0	922.8	925.2	924.7	921.4	946.8	940.5	946.1	906.4	8 25
INT SSH MANIF (P)-10	TE0530	916.7	925.7	922.2	928.5	926.8	923.9	933.9	935.4	950.7	896.7	8 26
INT SSH MANIF (P)-11	TE0531	908.1	911.1	915.5	916.9	919.0	915.3	909.0	921.2	939.6	922.6	8 27
INT SSH MANIF (P)-12	TE0532	915.8	910.9	927.8	918.4	921.2	923.7	905.9	919.6	932.6	935.0	8 28
INT SSH MANIF (P)-13	TE0533	920.7	911.3	931.0	917.5	922.4	929.6	889.9	884.4	895.0	940.9	8 29
INT SSH MANIF (P)-14	TE0534	885.9	873.7	882.4	870.5	891.6	876.5	839.7	841.6	840.9	891.9	8 30
INT SH MAN LEG(P)-23	TE0543	905.2	903.6	921.0	911.9	914.0	918.5	904.0	922.1	934.6	924.0	9 25
INT SH MAN LEG(P)-24	TE0544	941.0	941.5	957.8	951.2	951.3	953.8	944.5	963.3	971.6	967.6	9 26

TEST NO.	1A	2A	3A	4A	5A	6A	8A	7A1	7A2	1
TEST SEQ. NO.	1	2	3	4	5	6	7	8	9	10
DATE	16Sep88	19Sep88	20Sep88	21Sep88	22Sep88	23Sep88	26Sep88	26Sep88	26Sep88	13Jun88
TIME START	1155	1025	1320	1045	1005	1025	0515	2355	0240	1055
TIME END	1605	1530	1715	1435	1415	1435	0715	0040	0355	1405
LOAD MW	850	850	846	850	847	849	646	433	435	851

DATA PAGE NO. 10 PULVERIZER COAL AND PA FLOW

PULV A COAL FLOW	XI002A	95.50	91.95	93.10	92.64	92.65	93.32	98.48	87.90	85.19	91.82	10 1
PULV B COAL FLOW	XI003A	95.30	91.72	93.30	92.62	92.81	93.17	.08	.10	.08	91.80	10 2
PULV C COAL FLOW	XI004A	95.97	92.65	93.54	93.22	93.39	93.67	.04	.04	.04	92.00	10 3
PULV D COAL FLOW	XI005A	94.56	.51	92.10	91.89	92.01	92.36	97.34	86.95	84.82	.52	10 4
PULV E COAL FLOW	XI006A	.04	91.65	0.00	92.17	92.36	92.83	98.03	0.00	0.00	91.18	10 5
PULV F COAL FLOW	XI007A	93.54	90.41	91.24	1.47	91.24	91.68	96.83	86.39	83.26	89.53	10 6
PULV G COAL FLOW	XI008A	94.69	91.28	92.40	91.98	92.08	.25	97.48	87.02	84.56	91.24	10 7
PULV H COAL FLOW	XI009A	95.70	91.83	92.75	92.33	.07	93.02	.05	.04	.04	91.44	10 8
PULV A PA FLOW	XI056A	208.0	210.2	213.6	213.1	208.9	209.4	215.6	207.4	206.2	210.7	10 16
PULV B PA FLOW	XI057A	206.9	207.6	210.6	210.0	205.0	208.4	0.0	0.0	0.0	210.7	10 17
PULV C PA FLOW	XI058A	203.6	204.0	205.7	205.6	201.3	203.1	0.0	0.0	0.0	195.6	10 18
PULV D PA FLOW	XI059A	206.2	0.0	207.6	209.1	206.9	206.5	211.3	204.0	202.5	0.0	10 19
PULV E PA FLOW	XI060A	0.0	207.4	0.0	210.3	204.1	207.4	209.6	0.0	0.0	209.8	10 20
PULV F PA FLOW	XI061A	198.2	205.0	205.2	0.0	204.1	203.4	208.6	200.6	199.3	205.6	10 21
PULV G PA FLOW	XI062A	200.2	203.5	205.7	204.9	201.7	0.0	207.4	199.6	198.4	208.0	10 22
PULV H PA FLOW	XI063A	200.6	205.2	206.4	205.8	0.0	202.7	0.0	0.0	0.0	206.0	10 23
PULV A PA FLOW	CALC	207.2	210.9	212.8	212.2	209.6	209.3	212.9	0.0	0.0	0.0	10 24
PULV B PA FLOW	CALC	215.4	216.0	219.1	218.4	209.9	213.4	0.0	0.0	0.0	0.0	10 25
PULV C PA FLOW	CALC	200.0	199.8	201.1	201.1	197.2	198.3	0.0	0.0	0.0	0.0	10 26
PULV D PA FLOW	CALC	209.2	0.0	209.9	211.4	209.2	210.2	213.2	0.0	0.0	0.0	10 27
PULV E PA FLOW	CALC	0.0	209.1	0.0	211.7	207.3	209.3	210.4	0.0	0.0	0.0	10 28
PULV F PA FLOW	CALC	221.5	221.1	222.0	0.0	221.7	216.3	226.1	0.0	0.0	0.0	10 29
PULV G PA FLOW	CALC	199.7	205.3	208.8	208.1	204.0	0.0	208.9	0.0	0.0	0.0	10 30
PULV H PA FLOW	CALC	203.1	205.5	207.0	206.6	0.0	202.5	0.0	0.0	0.0	0.0	10 15

DATA PAGE NO. 11 PULVERIZER INLET TEMP AND PA DIFF

PULV A INLET T	TE0639	331.0	294.2	273.3	278.6	310.3	309.9	294.1	295.1	289.5	282.5	11 1
PULV B INLET T	TE0640	326.9	300.1	282.8	287.4	327.4	306.8	88.0	92.4	91.0	282.4	11 2
PULV C INLET T	TE0641	335.1	308.1	301.3	301.8	337.9	327.2	96.3	124.0	104.5	343.9	11 3
PULV D INLET T	TE0642	337.6	79.4	307.8	298.7	317.6	324.2	316.1	310.1	309.5	93.8	11 4
PULV E INLET T	TE0643	100.3	313.6	86.3	298.1	346.5	326.0	339.7	108.9	96.9	297.6	11 5
PULV F INLET T	TE0644	371.3	325.3	328.0	86.8	339.6	348.9	336.8	338.9	337.1	317.9	11 6
PULV G INLET T	TE0645	382.2	332.5	318.5	325.5	354.4	87.7	342.8	339.8	340.2	301.9	11 7
PULV H INLET T	TE0646	376.3	316.4	311.9	316.8	98.6	348.3	97.9	101.3	99.4	310.8	11 8
PULV A INLET T	TEMPTC	327.2	296.5	281.8	286.4	307.2	307.7	296.0	0.0	0.0	12.6	11 9
PULV B INLET T	TEMPTC	338.8	309.1	292.6	299.6	347.2	317.7	91.5	0.0	0.0	0.0	11 10
PULV C INLET T	TEMPTC	347.8	322.3	312.0	313.1	350.2	342.8	93.0	0.0	0.0	0.0	11 11
PULV D INLET T	TEMPTC	350.7	83.7	332.3	320.9	331.0	344.5	324.7	0.0	0.0	0.0	11 12
PULV E INLET T	TEMPTC	103.0	298.5	87.0	284.6	328.7	309.3	317.5	0.0	0.0	0.0	11 13
PULV F INLET T	TEMPTC	338.7	312.0	312.7	85.0	313.2	332.4	322.4	0.0	0.0	0.0	11 14
PULV G INLET T	TEMPTC	361.0	327.1	310.6	310.5	345.6	90.1	342.8	0.0	0.0	0.0	11 15
PULV H INLET T	TEMPTC	340.6	316.5	299.4	302.0	96.5	320.4	95.5	0.0	0.0	0.0	10 14
PULV A PA DIFF	MAN	3.1800	3.1500	3.1500	3.1400	3.1600	3.1500	3.2000	0.0000	0.0000	0.0000	11 16

IP14\_000660

TEST NO.	1A	2A	3A	4A	5A	6A	8A	7A1	7A2	1
TEST SEQ. NO.	1	2	3	4	5	6	7	8	9	10
DATE	16Sep88	19Sep88	20Sep88	21Sep88	22Sep88	23Sep88	26Sep88	26Sep88	26Sep88	13Jun88
TIME START	1155	1025	1320	1045	1005	1025	0515	2355	0240	1055
TIME END	1605	1530	1715	1435	1415	1435	0715	0040	0355	1405
LOAD MW	850	850	846	850	847	849	646	433	435	851

DATA PAGE NO. 11 PULVERIZER INLET TEMP AND PA DIFF

PULV B PA DIFF	MAN	3.5700	3.4600	3.5000	3.4900	3.4000	3.4000	0.0000	0.0000	0.0000	0.0000	11 17
PULV C PA DIFF	MAN	2.8800	2.7800	2.8000	2.7900	2.8000	2.8000	0.0000	0.0000	0.0000	0.0000	11 18
PULV D PA DIFF	MAN	3.1900	0.0000	3.1300	3.1200	3.1000	3.1700	3.2000	0.0000	0.0000	0.0000	11 19
PULV E PA DIFF	MAN	0.0000	2.8400	0.0000	2.8600	2.9000	2.8800	2.9500	0.0000	0.0000	0.0000	11 20
PULV F PA DIFF	MAN	3.3200	3.1600	3.2100	0.0000	3.2000	3.1000	3.3400	0.0000	0.0000	0.0000	11 21
PULV G PA DIFF	MAN	3.1200	3.1300	3.1900	3.1700	3.1600	0.0000	3.2800	0.0000	0.0000	0.0000	11 22
PULV H PA DIFF	MAN	3.3600	3.2600	3.2800	3.2700	0.0000	3.2300	0.0000	0.0000	0.0000	0.0000	11 23
PULV A DIFF P	PT0150	10.89	10.50	10.65	11.14	9.96	10.66	10.73	9.13	8.99	10.16	11 24
PULV B DIFF P	PT0151	12.31	10.70	12.34	12.68	10.44	11.76	.03	.03	.03	11.66	11 25
PULV C DIFF P	PT0152	13.58	11.94	12.55	13.97	12.14	12.57	.06	.06	.06	13.60	11 26
PULV D DIFF P	PT0153	11.38	.01	11.53	11.98	11.07	12.00	11.56	9.65	9.36	.04	11 27
PULV E DIFF P	PT0154	.03	13.78	.02	15.28	13.67	14.49	14.16	.01	.02	12.98	11 28
PULV F DIFF P	PT0155	14.30	13.59	13.37	.05	15.10	14.81	14.04	12.47	12.08	13.35	11 29
PULV G DIFF P	PT0156	13.75	13.23	13.89	14.19	14.51	.03	14.47	11.28	11.75	13.45	11 30
PULV H DIFF P	PT0157	13.89	12.79	13.61	14.25	.08	13.63	.09	.09	.09	12.63	10 13

DATA PAGE NO. 12 OPERATOR POSITIONS %

RH-1 SP VLV POSIT	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12 1
SH-1 SP VLV POSIT-A	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12 3
SH-1 SP VLV POSIT-B	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12 4
SH-2 SP VLV POSIT-A	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12 5
SH-2 SP VLV POSIT-B	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12 6
RH PASS DMPR POS-A	XI136A	40.1	91.3	53.1	48.2	53.8	69.4	100.0	100.0	100.0	99.3	9 28
RH PASS DMPR POS-B	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12 16
SH PASS DMPR POS-A	XI135A	100.0	55.0	88.5	92.9	88.0	72.1	24.2	20.0	20.0	44.8	9 27
SH PASS DMPR POS-B	PB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12 18

DATA PAGE NO. 13 MISCELLANEOUS GAS DATA - B&W

O2 LVG PRI AH W	TRAV	6.5357	5.8416	5.9486	6.2693	6.4173	5.7708	7.2445	8.8464	9.4030	6.9038	13 5
O2 LVG PRI AH E	TRAV	6.0938	6.1426	6.5035	6.4591	5.6949	6.4840	7.1746	8.3941	8.9176	6.1059	13 6
CO2 LVG PRI AH W	TRAV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13 7
CO2 LVG PRI AH E	TRAV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13 8
O2 ENT PRI AH W	COMP O	2.9814	2.6120	2.1175	2.5763	3.3408	2.0318	3.4899	6.6591	5.6446	3.3001	13 13
O2 ENT PRI AH E	COMP O	2.9412	3.4244	2.9296	3.5107	2.8449	3.7866	4.2809	6.7310	6.1736	2.7619	13 14
CO2 ENT PRI AH W	COMP O	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13 15
CO2 ENT PRI AH E	COMP O	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13 16
GAS LVG RH PS (B)SW	GRID	746.6	747.0	750.6	745.0	742.3	747.6	721.5	680.6	662.2	746.6	13 21
GAS LVG RH PS (B)SE	GRID	741.2	742.5	744.3	739.9	738.7	744.2	721.0	682.0	664.7	749.2	13 22
GAS LVG PSH PS (B)NW	GRID	726.1	700.9	714.2	707.5	704.1	707.5	651.0	603.5	605.3	688.4	13 23
GAS LVG PSH PS (B)NE	GRID	729.1	699.7	712.9	706.3	709.7	707.7	657.3	608.5	611.5	689.6	13 24
A = RIGHT = EAST		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13 29

IP14\_000661

TEST NO.	1A	2A	3A	4A	5A	6A	8A	7A1	7A2	1
TEST SEQ. NO.	1	2	3	4	5	6	7	8	9	10
DATE	16Sep88	19Sep88	20Sep88	21Sep88	22Sep88	23Sep88	26Sep88	26Sep88	26Sep88	13Jun88
TIME START	1155	1025	1320	1045	1005	1025	0515	2355	0240	1055
TIME END	1605	1530	1715	1435	1415	1435	0715	0040	0355	1405
LOAD MW	850	850	846	850	847	849	646	433	435	851

DATA PAGE NO. 14 MISCELLANEOUS

O2 ENT BAG HS E TELE	4.5132	4.3353	4.5105	4.4477	3.9583	4.4959	5.2028	7.8223	7.4081	4.0448	14 24
O2 ENT BAG HS W TELE	4.0091	3.5982	3.9844	3.9597	4.1547	3.5411	4.6061	7.5295	6.8325	4.4889	14 25
GAS ENT BAG HS W GRID	306.4	290.9	298.8	295.8	285.4	295.2	274.6	256.5	249.2	300.4	14 26
GAS ENT BAG HS E GRID	307.3	288.8	300.3	292.6	286.6	293.3	271.6	256.0	249.0	284.2	14 27
GAS LVG PRI AH (B) W GRID	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14 28
GAS LVG PRI AH (B) E GRID	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14 29

DATA PAGE NO. 15 MISCELLANEOUS

PRI AH AIR IN P W MANO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 1
PRI AH AIR IN P E MANO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 2
PRI AH AIR OUT P W TRAV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 3
PRI AH AIR OUT P E TRAV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 4
PRI AH GAS IN P W TRAV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 5
PRI AH GAS IN P E TRAV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 6
PRI AH GAS OUT P W TRAV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 7
PRI AH GAS OUT P E TRAV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 8
PRI AH AIR-GAS DP W MANO	45.20	44.10	44.90	44.90	44.90	45.30	44.30	0.00	0.00	0.00	15 9
PRI AH AIR-GAS DP E MANO	45.20	44.00	44.80	44.80	44.70	45.10	44.00	0.00	0.00	0.00	15 10
SEC AH AIR IN P W MANO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 11
SEC AH AIR IN P E MANO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 12
SEC AH GAS IN P W TRAV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 13
SEC AH GAS IN P E TRAV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 14
SEC AH AIR-GAS DP W MANO	12.00	11.75	12.20	12.00	11.60	11.90	8.50	0.00	0.00	0.00	15 15
SEC AH AIR-GAS DP E MANO	13.00	12.50	13.00	12.80	12.35	12.60	9.00	0.00	0.00	0.00	15 16
SEC AH AIR OUT P W TRAV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 17
SEC AH AIR OUT P E TRAV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15 18
PRI AH GAS SIDE DP W MAN	1.5100	1.4900	1.4200	1.4400	1.6700	1.6100	1.3300	0.0000	0.0000	0.0000	15 19
PRI AH GAS SIDE DP E MAN	1.4900	1.4400	1.3700	1.4200	1.5900	1.5400	1.2100	0.0000	0.0000	0.0000	15 20
PRI AH AIR SIDE DP W MAN	.6600	.5000	.4800	.5000	.6200	.5900	.2000	0.0000	0.0000	0.0000	15 21
PRI AH AIR SIDE DP E MAN	.8000	.6800	.6200	.6100	.8000	.5700	0.0000	0.0000	0.0000	0.0000	15 22
SEC AH GAS SIDE DP W MAN	3.4500	3.4100	3.5000	3.5000	3.3000	3.4000	2.3000	0.0000	0.0000	0.0000	15 23
SEC AH GAS SIDE DP E MAN	3.4800	3.3000	3.5000	3.5000	3.2000	3.2000	2.3000	0.0000	0.0000	0.0000	15 24
SEC AH AIR SIDE DP W MAN	1.2500	1.2000	1.2000	1.2000	1.2000	1.2000	.6000	0.0000	0.0000	0.0000	15 25
SEC AH AIR SIDE DP E MAN	2.2900	2.1000	2.2000	2.2000	2.1000	2.0000	1.3000	0.0000	0.0000	0.0000	15 26
AIR IN TO FURN DP W MAN	5.7600	5.6000	5.9000	5.7000	5.5000	5.6000	3.9000	0.0000	0.0000	0.0000	15 27
AIR IN TO FURN DP E MAN	6.3700	6.1000	6.4000	6.2000	6.3000	4.4000	0.0000	0.0000	0.0000	0.0000	15 28
FURN TO GAS OUT DP W MAN	6.3800	6.3000	6.4000	6.4000	6.2000	6.2000	4.7000	0.0000	0.0000	0.0000	12 21
FURN TO GAS OUT DP E MAN	6.4200	6.3000	6.5000	6.5000	6.3000	6.3000	4.8000	0.0000	0.0000	0.0000	12 22

**IP14\_000663**

**APPENDIX 2**

**EFFICIENCY CALCULATIONS - INDIVIDUAL AIR HEATER BASIS**

		CONTRACT SUMMARY SHEET	TEST 1A CORRECTED FOR CONTR. CONDITIONS	TEST 1A WITH TEST CONDITIONS
Fuel			CONTRACT	TEST
Air Temp Ent AH	PRI/SEC	F	77/ 64	107/ 86
Air Temp Lvg AH	PRI/SEC	F	582/ 647	520/ 646
Air Flow Lvg AH (1)	PRI/SEC	MLB/HR	1335/5184	1424/5104
AH Air By-Pass Flow		MLB/HR	497.8	588.6
Mill Inlet Temp		F	397.2	0.0
Ave Air Temp Ent AH		F	66.7	66.8
Gas Temp Lvg Econ		F	736.0	733.2
Gas Temp Ent AH	PRI/SEC	F	736/ 736	722/ 733
Gas Temp Lvg AH (Incl Lkg)	PRI/SEC	F	279/ 282	-/-
Gas Temp Lvg AH (Excl Lkg)	PRI/SEC	F	313/ 295	322/ 303
Gas Flow Ent AH	PRI/SEC	MLB/HR	924/6286	842/6383
Ave Gas Temp Lvg AH (Excl Lkg)		F	294.7	305.5
Excess Air Lvg Econ		%	17.0	16.7
Excess Air Ent Pri AH		%	---	16.0
Excess Air Ent Sec AH		%	---	16.7
Excess Air Lvg Sec AH		%	---	22.6
Excess Air Lvg Pri AH		%	---	42.1
Excess Air to Burners		%	15.0	14.6
Sec AH Leakage		MLB/HR	422	---
Pri AH Leakage		MLB/HR	0	---
Moisture In Air		LB/LB DA	.0067	.0070
Dry Gas Wt Lvg Econ		LB/LB Fuel	---	10.585
Dry Air Wt to Burners		LB/LB Fuel	---	10.017
Wet Gas Wt Lvg Econ		LB/LB Fuel	---	11.179
Losses		%		
Dry Gas			4.84	5.20
H2O in Fuel		(2)	5.15	.88
H2 in Fuel			---	4.31
Moisture in Air			.07	.06
Unburned Combustible			.20	.10
Radiation			.17	.17
Unaccounted		(3)	1.00	.50
Summation of Losses			11.43	11.22
Efficiency		%	88.57	88.78
Unit Output		MKB	6691.5	6782.3
Fuel Input		MKB	7555.0	7625.7
Fuel Rate		MLB/HR	686.2	660.2

(1) Includes By-Pass Flow (2) Includes H2 in Fuel Loss  
(3) Includes Manufacturer's Margin of .5 %

TEST 1A : 16Sep88 : 1155-1605 : 850 MW DRY RUN FINAL INDIVIDUAL AHS JDR-110488

		CONTRACT SUMMARY SHEET	TEST 2A CORRECTED FOR CONTR. CONDITIONS	TEST 2A WITH TEST CONDITIONS
Fuel			CONTRACT	TEST
Air Temp Ent AH	PRI/SEC	F	77/ 64	89/ 68
Air Temp Lvg AH	PRI/SEC	F	582/ 647	527/ 631
Air Flow Lvg AH (1)	PRI/SEC	MLB/HR	1335/5184	1443/5069
AH Air By-Pass Flow		MLB/HR	497.8	712.8
Mill Inlet Temp		F	397.2	0.0
Ave Air Temp Ent AH		F	66.7	66.9
				72.4
Gas Temp Lvg Econ		F	736.0	724.3
Gas Temp Ent AH	PRI/SEC	F	736/ 736	714/ 724
Gas Temp Lvg AH (Incl Lkg)	PRI/SEC	F	279/ 282	-/-
Gas Temp Lvg AH (Excl Lkg)	PRI/SEC	F	313/ 295	331/ 293
Gas Flow Ent AH	PRI/SEC	MLB/HR	924/6286	793/6414
Ave Gas Temp Lvg AH (Excl Lkg)		F	294.7	297.2
				300.2
Excess Air Lvg Econ		%	17.0	17.0
Excess Air Ent Pri AH		%	---	17.0
Excess Air Ent Sec AH		%	---	17.0
Excess Air Lvg Sec AH		%	---	---
Excess Air Lvg Pri AH		%	---	---
Excess Air to Burners		%	15.0	15.0
Sec AH Leakage		MLB/HR	422	---
Pri AH Leakage		MLB/HR	0	---
				142
Moisture In Air		LB/LB DA	.0067	.0067
Dry Gas Wt Lvg Econ		LB/LB Fuel	---	10.003
Dry Air Wt to Burners		LB/LB Fuel	---	9.475
Wet Gas Wt Lvg Econ		LB/LB Fuel	---	10.558
				11.511
Losses		\$		
Dry Gas			4.84	5.02
H2O in Fuel		(2)	5.15	.87
H2 in Fuel			---	4.29
Moisture in Air			.07	.06
Unburned Combustible			.20	.06
Radiation			.17	.17
Unaccounted		(3)	1.00	.50
Summation of Losses			11.43	10.97
				10.88
Efficiency		%	88.57	89.03
				89.12
Unit Output		MKB	6691.5	6691.5
Fuel Input		MKB	7555.0	7516.0
Fuel Rate		MLB/HR	686.2	682.7
				635.0

(1) Includes By-Pass Flow (2) Includes H2 in Fuel Loss

(3) Includes Manufacturer's Margin of .5 %

TEST 2A : 19Sep88 : 1025-1530 :850 MW D MILL OUT FINAL INDIVIDUAL AHS JDR-110488

		CONTRACT SUMMARY SHEET	TEST 3A CORRECTED FOR CONTR. CONDITIONS	TEST 3A WITH TEST CONDITIONS
Fuel				
Air Temp Ent AH	PRI/SEC F	77 / 64	77 / 64	89 / 69
Air Temp Lvg AH	PRI/SEC F	582 / 647	0 / 0	527 / 639
Air Flow Lvg AH (1)	PRI/SEC MLB/HR	1335/5184	1455/5079	1455/5254
AH Air By-Pass Flow	MLB/HR	497.8	750.2	750.2
Mill Inlet Temp	F	397.2	0.0	303.1
Ave Air Temp Ent AH	F	66.7	66.9	73.2
Gas Temp Lvg Econ	F	736.0	729.7	729.7
Gas Temp Ent AH	PRI/SEC F	736 / 736	715 / 730	715 / 730
Gas Temp Lvg AH (Incl Lkg)	PRI/SEC F	279 / 282	- / -	300 / 299
Gas Temp Lvg AH (Excl Lkg)	PRI/SEC F	313 / 295	339 / 306	346 / 309
Gas Flow Ent AH	PRI/SEC MLB/HR	924/6286	777/6456	777/6644
Ave Gas Temp Lvg AH (Excl Lkg)	F	294.7	309.4	312.8
Excess Air Lvg Econ	%	17.0	17.0	16.9
Excess Air Ent Pri AH	%	---	17.0	13.3
Excess Air Ent Sec AH	%	---	17.0	16.9
Excess Air Lvg Sec AH	%	---	---	22.4
Excess Air Lvg Pri AH	%	---	---	41.2
Excess Air to Burners	%	15.0	15.0	14.8
Sec AH Leakage	MLB/HR	422	---	287
Pri AH Leakage	MLB/HR	0	---	176
Moisture In Air	LB/LB DA	.0067	.0067	.0070
Dry Gas Wt Lvg Econ	LB/LB Fuel	---	10.000	10.895
Dry Air Wt to Burners	LB/LB Fuel	---	9.472	10.319
Wet Gas Wt Lvg Econ	LB/LB Fuel	---	10.555	11.494
Losses	%			
Dry Gas		4.84	5.29	5.29
H2O in Fuel	(2) 5.15	.88	.81	
H2 in Fuel		---	4.31	4.35
Moisture in Air		.07	.06	.07
Unburned Combustible		.20	.09	.09
Radiation		.17	.17	.16
Unaccounted	(3) 1.00	.50	.50	
Summation of Losses		11.43	11.30	11.27
Efficiency	%	88.57	88.70	88.73
Unit Output	MKB	6691.5	6691.5	6779.2
Fuel Input	MKB	7555.0	7544.0	7640.3
Fuel Rate	MLB/HR	686.2	685.2	645.6

(1) Includes By-Pass Flow (2) Includes H2 in Fuel Loss  
 (3) Includes Manufacturer's Margin of .5 %

TEST 3A : 20Sep88 : 1320-1715 :846 MW E MILL OUT FINAL INDIVIDUAL AHS JDR-110488

		CONTRACT SUMMARY SHEET	TEST 4A CORRECTED FOR CONTR. CONDITIONS	TEST 4A WITH TEST CONDITIONS
Fuel			CONTRACT	TEST
Air Temp Ent AH	PRI/SEC F	77/ 64	77/ 64	88/ 67
Air Temp Lvg AH	PRI/SEC F	582/ 647	0/ 0	525/ 632
Air Flow Lvg AH (1)	PRI/SEC MLB/HR	1335/5184	1459/5063	1459/5338
AH Air By-Pass Flow	MLB/HR	497.8	754.8	754.8
Mill Inlet Temp	F	397.2	0.0	300.8
Ave Air Temp Ent AH	F	66.7	66.9	71.7
Gas Temp Lvg Econ	F	736.0	722.4	722.4
Gas Temp Ent AH	PRI/SEC F	736/ 736	708/ 722	708/ 722
Gas Temp Lvg AH (Incl Lkg)	PRI/SEC F	279/ 282	-/-	301/ 293
Gas Temp Lvg AH (Excl Lkg)	PRI/SEC F	313/ 295	336/ 299	343/ 301
Gas Flow Ent AH	PRI/SEC MLB/HR	924/6286	785/6434	785/6721
Ave Gas Temp Lvg AH (Excl Lkg)	F	294.7	302.6	305.0
Excess Air Lvg Econ	%	17.0	17.0	17.8
Excess Air Ent Pri AH	%	---	17.0	16.6
Excess Air Ent Sec AH	%	---	17.0	17.8
Excess Air Lvg Sec AH	%	---	---	22.1
Excess Air Lvg Pri AH	%	---	---	42.5
Excess Air to Burners	%	15.0	15.0	15.7
Sec AH Leakage	MLB/HR	422	---	227
Pri AH Leakage	MLB/HR	0	---	161
Moisture In Air	LB/LB DA	.0067	.0067	.0071
Dry Gas Wt Lvg Econ	LB/LB Fuel	---	9.997	11.082
Dry Air Wt to Burners	LB/LB Fuel	---	9.469	10.502
Wet Gas Wt Lvg Econ	LB/LB Fuel	---	10.552	11.680
Losses	%			
Dry Gas		4.84	5.14	5.20
H2O in Fuel	(2)	5.15	.88	.75
H2 in Fuel		---	4.30	4.32
Moisture in Air		.07	.06	.07
Unburned Combustible		.20	.12	.12
Radiation		.17	.17	.16
Unaccounted	(3)	1.00	.50	.50
Summation of Losses		11.43	11.17	11.12
Efficiency	%	88.57	88.83	88.88
Unit Output	MKB	6691.5	6691.5	6818.1
Fuel Input	MKB	7555.0	7532.9	7671.1
Fuel Rate	MLB/HR	686.2	684.2	642.6

(1) Includes By-Pass Flow (2) Includes H2 in Fuel Loss  
 (3) Includes Manufacturer's Margin of .5 %

TEST 4A : 21Sep88 : 1045-1435 :850 MW F MILL OUT FINAL INDIVIDUAL AHS JDR-110488

			TEST 5A CONTRACT SUMMARY SHEET.	CORRECTED FOR CONTR. CONDITIONS	TEST 5A WITH TEST CONDITIONS
Fuel					
Air Temp Ent AH	PRI/SEC	F	77 / 64	77 / 64	86 / 64
Air Temp Lvg AH	PRI/SEC	F	582 / 647	0 / 0	519 / 629
Air Flow Lvg AH (1)	PRI/SEC	MLB/HR	1335/5184	1432/5078	1432/5196
AH Air By-Pass Flow		MLB/HR	497.8	620.8	620.8
Mill Inlet Temp		F	397.2	0.0	333.2
Ave Air Temp Ent AH		F	66.7	66.9	68.7
Gas Temp Lvg Econ		F	736.0	722.9	722.9
Gas Temp Ent AH	PRI/SEC	F	736 / 736	710 / 723	710 / 723
Gas Temp Lvg AH (Incl Lkg)	PRI/SEC	F	279 / 282	- / -	301 / 284
Gas Temp Lvg AH (Excl Lkg)	PRI/SEC	F	313 / 295	333 / 291	338 / 291
Gas Flow Ent AH	PRI/SEC	MLB/HR	924/6286	883/6323	883/6455
Ave Gas Temp Lvg AH (Excl Lkg)		F	294.7	296.0	296.5
Excess Air Lvg Econ		%	17.0	17.0	16.8
Excess Air Ent Pri AH		%	---	17.0	16.9
Excess Air Ent Sec AH		%	---	17.0	16.8
Excess Air Lvg Sec AH		%	---	---	21.2
Excess Air Lvg Pri AH		%	---	---	39.6
Excess Air to Burners		%	15.0	15.0	14.7
Sec AH Leakage		MLB/HR	422	---	222
Pri AH Leakage		MLB/HR	0	---	158
Moisture In Air		LB/LB DA	.0067	.0067	.0075
Dry Gas Wt Lvg Econ		LB/LB Fuel	---	10.004	10.838
Dry Air Wt to Burners		LB/LB Fuel	---	9.476	10.258
Wet Gas Wt Lvg Econ		LB/LB Fuel	---	10.559	11.442
Losses		%			
Dry Gas			4.84	5.00	5.01
H2O in Fuel		(2)	5.15	.87	.85
H2 in Fuel			---	4.29	4.29
Moisture in Air			.07	.06	.07
Unburned Combustible			.20	.05	.05
Radiation			.17	.17	.16
Unaccounted		(3)	1.00	.50	.50
Summation of Losses			11.43	10.94	10.93
Efficiency		%	88.57	89.06	89.07
Unit Output		MKB	6691.5	6691.5	6763.2
Fuel Input		MKB	7555.0	7513.5	7593.1
Fuel Rate		MLB/HR	686.2	682.4	641.3

(1) Includes By-Pass Flow    (2) Includes H2 in Fuel Loss  
 (3) Includes Manufacturer's Margin of .5 %

TEST 5A : 22Sep88 : 1005-1415 :847 MW H MILL OUT FINAL INDIVIDUAL AHS JDR-110488

			TEST 6A CORRECTED FOR CONTR. CONDITIONS	TEST 6A WITH TEST CONDITIONS
		CONTRACT SUMMARY SHEET	CONTRACT SUMMARY SHEET	CONTRACT SUMMARY SHEET
Fuel				
Air Temp Ent AH	PRI/SEC	F	77 / 64	77 / 64
Air Temp Lvg AH	PRI/SEC	F	582 / 647	0 / 0
Air Flow Lvg AH (1)	PRI/SEC	MLB/HR	1335/5184	1441/5077
AH Air By-Pass Flow		MLB/HR	497.8	662.4
Mill Inlet Temp		F	397.2	0.0
Ave Air Temp Ent AH		F	66.7	66.9
Gas Temp Lvg Econ		F	736.0	728.4
Gas Temp Ent AH	PRI/SEC	F	736 / 736	714 / 728
Gas Temp Lvg AH (Incl Lkg)	PRI/SEC	F	279 / 282	- / -
Gas Temp Lvg AH (Excl Lkg)	PRI/SEC	F	313 / 295	332 / 296
Gas Flow Ent AH	PRI/SEC	MLB/HR	924/6286	836/6378
Ave Gas Temp Lvg AH (Excl Lkg)		F	294.7	300.0
Excess Air Lvg Econ		%	17.0	17.0
Excess Air Ent Pri AH		%	---	17.0
Excess Air Ent Sec AH		%	---	17.0
Excess Air Lvg Sec AH		%	---	---
Excess Air Lvg Pri AH		%	---	---
Excess Air to Burners		%	15.0	15.0
Sec AH Leakage		MLB/HR	422	---
Pri AH Leakage		MLB/HR	0	---
Moisture In Air		LB/LB DA	.0067	.0067
Dry Gas Wt Lvg Econ		LB/LB Fuel	---	10.005
Dry Air Wt to Burners		LB/LB Fuel	---	9.477
Wet Gas Wt Lvg Econ		LB/LB Fuel	---	10.561
Losses		%		
Dry Gas			4.84	5.08
H2O in Fuel		(2)	5.15	.88
H2 in Fuel			---	4.30
Moisture in Air			.07	.06
Unburned Combustible			.20	.04
Radiation			.17	.17
Unaccounted		(3)	1.00	.50
Summation of Losses			11.43	11.03
Efficiency		%	88.57	88.97
Unit Output		MKB	6691.5	6691.5
Fuel Input		MKB	7555.0	7521.1
Fuel Rate		MLB/HR	686.2	683.1

(1) Includes By-Pass Flow    (2) Includes H2 in Fuel Loss  
 (3) Includes Manufacturer's Margin of .5 %

TEST 6A : 23Sep88 : 1025-1435 :849 MW G MILL OUT FINAL INDIVIDUAL AH JDR-110488

		CONTRACT SUMMARY SHEET	TEST 7A1 CORRECTED FOR CONTR. CONDITIONS	TEST 7A1 WITH TEST CONDITIONS
Fuel			CONTRACT	TEST
Air Temp Ent AH	PRI/SEC F	77/ 64	77/ 64	100/ 71
Air Temp Lvg AH	PRI/SEC F	582/ 647	0/ 0	507/ 575
Air Flow Lvg AH (1)	PRI/SEC MLB/HR	1335/5184	812/5642	812/3532
AH Air By-Pass Flow	MLB/HR	497.8	374.8	374.8
Mill Inlet Temp	F	397.2	0.0	320.7
Ave Air Temp Ent AH	F	66.7	65.6	76.3
Gas Temp Lvg Econ	F	736.0	654.8	654.8
Gas Temp Ent AH	PRI/SEC F	736/ 736	647/ 655	647/ 655
Gas Temp Lvg AH (Incl Lkg)	PRI/SEC F	279/ 282	-/-	296/ 251
Gas Temp Lvg AH (Excl Lkg)	PRI/SEC F	313/ 295	310/ 258	323/ 263
Gas Flow Ent AH	PRI/SEC MLB/HR	924/6286	519/6624	519/4259
Ave Gas Temp Lvg AH (Excl Lkg)	F	294.7	261.9	269.4
Excess Air Lvg Econ	%	17.0	17.0	44.7
Excess Air Ent Pri AH	%	---	17.0	45.7
Excess Air Ent Sec AH	%	---	17.0	44.7
Excess Air Lvg Sec AH	%	---	---	55.1
Excess Air Lvg Pri AH	%	---	---	68.1
Excess Air to Burners	%	15.0	15.0	40.8
Sec AH Leakage	MLB/HR	422	---	286
Pri AH Leakage	MLB/HR	0	---	75
Moisture In Air	LB/LB DA	.0067	.0067	.0052
Dry Gas Wt Lvg Econ	LB/LB Fuel	---	10.001	13.335
Dry Air Wt to Burners	LB/LB Fuel	---	9.473	12.605
Wet Gas Wt Lvg Econ	LB/LB Fuel	---	10.556	13.937
Losses	%			
Dry Gas		4.84	4.28	5.22
H2O in Fuel	(2)	5.15	.86	.84
H2 in Fuel		---	4.24	4.30
Moisture in Air		.07	.05	.05
Unburned Combustible		.20	.08	.08
Radiation		.17	.17	.30
Unaccounted	(3)	1.00	.50	.50
Summation of Losses		11.43	10.18	11.29
Efficiency	%	88.57	89.82	88.71
Unit Output	MKB	6691.5	6691.5	3603.3
Fuel Input	MKB	7555.0	7449.9	4061.9
Fuel Rate	MLB/HR	686.2	676.6	342.8

(1) Includes By-Pass Flow    (2) Includes H2 in Fuel Loss  
 (3) Includes Manufacturer's Margin of .5 %

TEST 7A1 : 26Sep88 : 2355-0040 :433 MW 50% LOAD FINAL INDIVIDUAL AHS JDR-110488

			TEST 7A2 CORRECTED FOR CONTR. CONDITIONS	TEST 7A2 WITH TEST CONDITIONS
		CONTRACT SUMMARY SHEET	CONTRACT	TEST
Fuel				
Air Temp Ent AH	PRI/SEC	F	77/ 64	77/ 64
Air Temp Lvg AH	PRI/SEC	F	582/ 647	0/ 0
Air Flow Lvg AH (1)	PRI/SEC	MLB/HR	1335/5184	806/5632
AH Air By-Pass Flow		MLB/HR	497.8	366.8
Mill Inlet Temp		F	397.2	0.0
Ave Air Temp Ent AH		F	66.7	65.6
Gas Temp Lvg Econ		F	736.0	640.5
Gas Temp Ent AH	PRI/SEC	F	736/ 736	632/ 641
Gas Temp Lvg AH (Incl Lkg)	PRI/SEC	F	279/ 282	-/-
Gas Temp Lvg AH (Excl Lkg)	PRI/SEC	F	313/ 295	333/ 247
Gas Flow Ent AH	PRI/SEC	MLB/HR	924/6286	576/6551
Ave Gas Temp Lvg AH (Excl Lkg)		F	294.7	253.6
Excess Air Lvg Econ		%	17.0	17.0
Excess Air Ent Pri AH		%	---	17.0
Excess Air Ent Sec AH		%	---	17.0
Excess Air Lvg Sec AH		%	---	---
Excess Air Lvg Pri AH		%	---	---
Excess Air to Burners		%	15.0	15.0
Sec AH Leakage		MLB/HR	422	---
Pri AH Leakage		MLB/HR	0	---
Moisture In Air		LB/LB DA	.0067	.0067
Dry Gas Wt Lvg Econ		LB/LB Fuel	---	10.001
Dry Air Wt to Burners		LB/LB Fuel	---	9.473
Wet Gas Wt Lvg Econ		LB/LB Fuel	---	10.556
Losses		%		
Dry Gas			4.84	4.10
H2O in Fuel		(2)	5.15	.86
H2 in Fuel			---	4.22
Moisture in Air			.07	.05
Unburned Combustible			.20	.08
Radiation			.17	.17
Unaccounted		(3)	1.00	.50
Summation of Losses			11.43	9.98
Efficiency		%	88.57	90.02
Unit Output		MKB	6691.5	6691.5
Fuel Input		MKB	7555.0	7433.3
Fuel Rate		MLB/HR	686.2	675.1

(1) Includes By-Pass Flow (2) Includes H2 in Fuel Loss

(3) Includes Manufacturer's Margin of .5 %

TEST 7A2 : 26Sep88 : 0240-0355 : 435 MW 50% LOAD AFTER SOOTBLOWING RH JDR-110488

			TEST 8A CONTRACT SUMMARY SHEET	CORRECTED FOR CONTR. CONDITIONS	TEST 8A WITH TEST CONDITIONS
Fuel					
Air Temp Ent AH	PRI/SEC	F	77 / 64	77 / 64	94 / 69
Air Temp Lvg AH	PRI/SEC	F	582 / 647	0 / 0	524 / 604
Air Flow Lvg AH (1)	PRI/SEC	MLB/HR	1335/5184	1052/5434	1052/4113
AH Air By-Pass Flow		MLB/HR	497.8	489.5	489.5
Mill Inlet Temp		F	397.2	0.0	325.6
Ave Air Temp Ent AH		F	66.7	66.1	74.1
Gas Temp Lvg Econ		F	736.0	697.5	697.5
Gas Temp Ent AH	PRI/SEC	F	736 / 736	685 / 698	685 / 698
Gas Temp Lvg AH (Incl Lkg)	PRI/SEC	F	279 / 282	- / -	306 / 268
Gas Temp Lvg AH (Excl Lkg)	PRI/SEC	F	313 / 295	341 / 275	351 / 278
Gas Flow Ent AH	PRI/SEC	MLB/HR	924/6286	676/6503	676/5051
Ave Gas Temp Lvg AH (Excl Lkg)		F	294.7	281.0	286.7
Excess Air Lvg Econ		%	17.0	17.0	20.3
Excess Air Ent Pri AH		%	---	17.0	22.2
Excess Air Ent Sec AH		%	---	17.0	20.3
Excess Air Lvg Sec AH		%	---	---	27.2
Excess Air Lvg Pri AH		%	---	---	51.1
Excess Air to Burners		%	15.0	15.0	17.6
Sec AH Leakage		MLB/HR	422	---	268
Pri AH Leakage		MLB/HR	0	---	148
Moisture In Air		LB/LB DA	.0067	.0067	.0067
Dry Gas Wt Lvg Econ		LB/LB Fuel	---	10.002	11.268
Dry Air Wt to Burners		LB/LB Fuel	---	9.474	10.644
Wet Gas Wt Lvg Econ		LB/LB Fuel	---	10.557	11.883
Losses		%			
Dry Gas			4.84	4.69	4.81
H2O in Fuel		(2)	5.15	.87	.81
H2 in Fuel			---	4.27	4.39
Moisture in Air			.07	.06	.06
Unburned Combustible			.20	.07	.07
Radiation			.17	.17	.21
Unaccounted		(3)	1.00	.50	.50
Summation of Losses			11.43	10.63	10.85
Efficiency		%	88.57	89.37	89.15
Unit Output		MKB	6691.5	6691.5	5139.8
Fuel Input		MKB	7555.0	7487.4	5765.3
Fuel Rate		MLB/HR	686.2	680.1	482.0

(1) Includes By-Pass Flow (2) Includes H2 in Fuel Loss  
(3) Includes Manufacturer's Margin of .5 %

TEST 8A : 26Sep88 : 0515-0715 : 646 MW 75% LOAD FINAL INDIVIDUAL AHS JDR-110788

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**APPENDIX 3**  
**BOILER OUTPUT CALCULATIONS**

RB-615

31 Oct 1988

13:39:13

TEST NO 1A DATE 16Sep88 TIME START 1155 TIME END 1605

USING MEASURED FW FLOW  
USING DATA CHOICE 1

DRUM, SAT FLUID	P = 2629.2 PSIG	T = 676.4 F	H = 750.1 BTU/LB
DRUM, SAT VAPOR	P = 2629.2 PSIG	T = 676.4 F	H = 1076.8 BTU/LB
DRUM, BLOWDOWN	P = 2629.2 PSIG	T = 676.4 F	H = 750.1 BTU/LB
SH SPRAY	P = 2779.2 PSIG	T = 344.4 F	H = 320.2 BTU/LB
ENT SEC.	P = 2525.9 PSIG	T = 773.7 F	H = 1274.0 BTU/LB
LVG PRI-2	P = 2525.9 PSIG	T = 775.9 F	H = 1276.4 BTU/LB
ENT PRI-2	P = 2558.5 PSIG	T = 718.4 F	H = 1198.6 BTU/LB
LVG PRI-1	P = 2558.5 PSIG	T = 722.7 F	H = 1205.5 BTU/LB
ENT ECON	P = 2679.2 PSIG	T = 549.0 F	H = 545.4 BTU/LB
LVG SEC SH	P = 2406.3 PSIG	T = 1006.8 F	H = 1464.7 BTU/LB
ENT RH-1 ATTEMP	P = 548.1 PSIG	T = 625.0 F	H = 1309.4 BTU/LB
ENT RH-1	P = 548.1 PSIG	T = 596.3 F	H = 1291.2 BTU/LB
LVG RH-1	P = 507.7 PSIG	T = 1017.3 F	H = 1529.0 BTU/LB
NO. 1 HTR FW ENT	P = 2679.2 PSIG	T = 471.5 F	H = 455.4 BTU/LB
NO. 1 HTR FW LVG	P = 2679.2 PSIG	T = 549.2 F	H = 545.6 BTU/LB
NO. 1 HTR DRAIN	P = 1047.3 PSIG	T = 485.6 F	H = 471.0 BTU/LB
NO. 1 HTR EXTR	P = 1047.3 PSIG	T = 794.3 F	H = 1383.1 BTU/LB
NO. 2 HTR FW ENT	P = 2679.2 PSIG	T = 393.6 F	H = 371.3 BTU/LB
NO. 2 HTR FW LVG	P = 2679.2 PSIG	T = 471.5 F	H = 455.4 BTU/LB
NO. 2 HTR DRAIN	P = 533.2 PSIG	T = 402.5 F	H = 378.2 BTU/LB
NO. 2 HTR EXTR	P = 533.2 PSIG	T = 623.4 F	H = 1309.6 BTU/LB
RH-1 SPRAY	P = 748.1 PSIG	T = 338.5 F	H = 310.8 BTU/LB
CORR ENT RH-1	P = 548.1 PSIG	T = 614.3 F	H = 1302.7 BTU/LB
1st STAGE SPRAY	MEASURED 34.7	CALCULATED 47.2	USED C
2nd STAGE SPRAY	MEASURED 12.1	CALCULATED 15.3	USED C
RH-1 SPRAY	MEASURED 33.8	CALCULATED 92.3	USED M

FLOWS MLB/HR HEAT ABSORPTION MKB/HR

STEAM LVG SEC SH	= 6126.5	BOILER	= 3222.4
STEAM LVG PRI-2 SH	= 6111.2	BLOWDOWN HEAT	= 0.0
STEAM LVG PRI-1 SH	= 6064.1	EXTRACTION HEAT	= 0.0
FEEDWATER TO ECON	= 6064.1	SUPERHEATER	= 2424.2
BLOWDOWN	= 0.0	REHEATER 1	= 1135.7
SH EXTRACTION	= 0.0	REHEATER 2	= 0.0
STEAM LVG RH-1	= 5017.6	TOTAL OUTPUT	= 6782.3
STEAM ENT RH-1 ATTEMP	= 4983.8		
NO. 1 HTR. EXTR. FLOW	= 599.5		
NO. 2 HTR. EXTR. FLOW	= 488.0		
TURB LKG	= 55.3		

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RB-615

31 Oct 1988

13:40:06

TEST NO 2A DATE 19Sep88 TIME START 1025 TIME END 1530

USING MEASURED FW FLOW  
USING DATA CHOICE 1

DRUM, SAT FLUID	P = 2632.8 PSIG	T = 676.6 F	H = 750.5 BTU/LB
DRUM, SAT VAPOR	P = 2632.8 PSIG	T = 676.6 F	H = 1076.3 BTU/LB
DRUM, BLOWDOWN	P = 2632.8 PSIG	T = 676.6 F	H = 750.5 BTU/LB
SH SPRAY	P = 2782.8 PSIG	T = 337.3 F	H = 312.9 BTU/LB
ENT SEC.	P = 2528.3 PSIG	T = 772.6 F	H = 1272.6 BTU/LB
LVG PRI-2	P = 2528.3 PSIG	T = 774.5 F	H = 1274.7 BTU/LB
ENT PRI-2	P = 2561.3 PSIG	T = 713.1 F	H = 1189.2 BTU/LB
LVG PRI-1	P = 2561.3 PSIG	T = 714.9 F	H = 1192.3 BTU/LB
ENT ECON	P = 2682.8 PSIG	T = 548.2 F	H = 544.3 BTU/LB
LVG SEC SH	P = 2407.3 PSIG	T = 1002.5 F	H = 1461.8 BTU/LB
ENT RH-1 ATTEMP	P = 543.0 PSIG	T = 619.3 F	H = 1306.3 BTU/LB
ENT RH-1	P = 543.0 PSIG	T = 616.7 F	H = 1304.7 BTU/LB
LVG RH-1	P = 502.9 PSIG	T = 1008.7 F	H = 1524.5 BTU/LB
NO. 1 HTR FW ENT	P = 2682.8 PSIG	T = 474.8 F	H = 459.1 BTU/LB
NO. 1 HTR FW LVG	P = 2682.8 PSIG	T = 548.7 F	H = 545.0 BTU/LB
NO. 1 HTR DRAIN	P = 1043.0 PSIG	T = 485.1 F	H = 470.3 BTU/LB
NO. 1 HTR EXTR	P = 1043.0 PSIG	T = 789.2 F	H = 1380.1 BTU/LB
NO. 2 HTR FW ENT	P = 2682.8 PSIG	T = 392.2 F	H = 369.9 BTU/LB
NO. 2 HTR FW LVG	P = 2682.8 PSIG	T = 474.8 F	H = 459.1 BTU/LB
NO. 2 HTR DRAIN	P = 528.3 PSIG	T = 401.4 F	H = 377.0 BTU/LB
NO. 2 HTR EXTR	P = 528.3 PSIG	T = 617.7 F	H = 1306.5 BTU/LB
RH-1 SPRAY	P = 743.0 PSIG	T = 95.8 F	H = 65.8 BTU/LB
CORR ENT RH-1	P = 543.0 PSIG	T = 615.9 F	H = 1304.2 BTU/LB
1st STAGE SPRAY	MEASURED 10.0	CALCULATED 21.8	USED C
2nd STAGE SPRAY	MEASURED 0.0	CALCULATED 13.4	USED C
RH-1 SPRAY	MEASURED 8.7	CALCULATED 6.6	USED M

FLOWS MLB/HR HEAT ABSORPTION MKB/HR

STEAM LVG SEC SH	= 6167.1	BOILER	= 3262.3
STEAM LVG PRI-2 SH	= 6153.7	BLOWDOWN HEAT	= 0.0
STEAM LVG PRI-1 SH	= 6131.9	EXTRACTION HEAT	= 0.0
FEEDWATER TO ECON	= 6131.9	SUPERHEATER	= 2404.3
BLOWDOWN	= 0.0	REHEATER 1	= 1104.0
SH EXTRACTION	= 0.0	REHEATER 2	= 0.0
STEAM LVG RH-1	= 5010.7	TOTAL OUTPUT	= 6770.5
STEAM ENT RH-1 ATTEMP	= 5002.1		
NO. 1 HTR. EXTR. FLOW	= 578.8		
NO. 2 HTR. EXTR. FLOW	= 530.6		
TURB LKG	= 55.6		

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RB-615

31 Oct 1988

13:41:01

TEST NO 3A DATE 20Sep88 TIME START 1320 TIME END 1715

USING MEASURED FW FLOW  
USING DATA CHOICE 1

DRUM, SAT FLUID	P = 2629.1 PSIG	T = 676.4 F	H = 750.1 BTU/LB
DRUM, SAT VAPOR	P = 2629.1 PSIG	T = 676.4 F	H = 1076.8 BTU/LB
DRUM, BLOWDOWN	P = 2629.1 PSIG	T = 676.4 F	H = 750.1 BTU/LB
SH SPRAY	P = 2779.1 PSIG	T = 343.4 F	H = 319.2 BTU/LB
ENT SEC.	P = 2524.4 PSIG	T = 773.9 F	H = 1274.3 BTU/LB
LVG PRI-2	P = 2524.4 PSIG	T = 781.2 F	H = 1282.0 BTU/LB
ENT PRI-2	P = 2557.4 PSIG	T = 718.3 F	H = 1198.6 BTU/LB
LVG PRI-1	P = 2557.4 PSIG	T = 719.8 F	H = 1201.0 BTU/LB
ENT ECON	P = 2679.1 PSIG	T = 548.9 F	H = 545.1 BTU/LB
LVG SEC SH	P = 2403.1 PSIG	T = 1008.7 F	H = 1466.1 BTU/LB
ENT RH-1 ATTEMP	P = 545.3 PSIG	T = 625.2 F	H = 1309.8 BTU/LB
ENT RH-1	P = 545.3 PSIG	T = 622.2 F	H = 1307.9 BTU/LB
LVG RH-1	P = 505.2 PSIG	T = 1009.6 F	H = 1524.9 BTU/LB
NO. 1 HTR FW ENT	P = 2679.1 PSIG	T = 475.5 F	H = 459.8 BTU/LB
NO. 1 HTR FW LVG	P = 2679.1 PSIG	T = 549.3 F	H = 545.7 BTU/LB
NO. 1 HTR DRAIN	P = 1049.9 PSIG	T = 484.6 F	H = 469.8 BTU/LB
NO. 1 HTR EXTR	P = 1049.9 PSIG	T = 796.2 F	H = 1384.1 BTU/LB
NO. 2 HTR FW ENT	P = 2679.1 PSIG	T = 392.7 F	H = 370.4 BTU/LB
NO. 2 HTR FW LVG	P = 2679.1 PSIG	T = 475.5 F	H = 459.8 BTU/LB
NO. 2 HTR DRAIN	P = 530.5 PSIG	T = 401.9 F	H = 377.5 BTU/LB
NO. 2 HTR EXTR	P = 530.5 PSIG	T = 623.6 F	H = 1309.9 BTU/LB
RH-1 SPRAY	P = 745.3 PSIG	T = 95.9 F	H = 65.9 BTU/LB
CORR ENT RH-1	P = 545.3 PSIG	T = 622.4 F	H = 1308.0 BTU/LB
1st STAGE SPRAY	MEASURED 9.5	CALCULATED 16.6	USED C
2nd STAGE SPRAY	MEASURED 43.4	CALCULATED 49.1	USED C
RH-1 SPRAY	MEASURED 7.1	CALCULATED 7.5	USED M

FLOWS MLB/HR HEAT ABSORPTION MKB/HR

STEAM LVG SEC SH	= 6163.9	BOILER	= 3241.9
STEAM LVG PRI-2 SH	= 6114.7	BLOWDOWN HEAT	= 0.0
STEAM LVG PRI-1 SH	= 6098.1	EXTRACTION HEAT	= 0.0
FEEDWATER TO ECON	= 6098.1	SUPERHEATER	= 2449.7
BLOWDOWN	= 0.0	REHEATER 1	= 1087.6
SH EXTRACTION	= 0.0	REHEATER 2	= 0.0
STEAM LVG RH-1	= 5014.5	TOTAL OUTPUT	= 6779.2
STEAM ENT RH-1 ATTEMP	= 5007.5		
NO. 1 HTR. EXTR. FLOW	= 573.0		
NO. 2 HTR. EXTR. FLOW	= 527.9		
TURB LKG	= 55.6		

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RB-615

31 Oct 1988

13:41:52

TEST NO 4A DATE 21Sep88 TIME START 1045 TIME END 1435

USING MEASURED FW FLOW  
USING DATA CHOICE 1

DRUM, SAT FLUID	P = 2629.0 PSIG	T = 676.4 F	H = 750.0 BTU/LB
DRUM, SAT VAPOR	P = 2629.0 PSIG	T = 676.4 F	H = 1076.8 BTU/LB
DRUM, BLOWDOWN	P = 2629.0 PSIG	T = 676.4 F	H = 750.0 BTU/LB
SH SPRAY	P = 2779.0 PSIG	T = 337.0 F	H = 312.6 BTU/LB
ENT SEC.	P = 2524.7 PSIG	T = 767.9 F	H = 1267.8 BTU/LB
LVG PRI-2	P = 2524.7 PSIG	T = 784.7 F	H = 1285.6 BTU/LB
ENT PRI-2	P = 2557.7 PSIG	T = 718.8 F	H = 1199.3 BTU/LB
LVG PRI-1	P = 2557.7 PSIG	T = 721.3 F	H = 1203.4 BTU/LB
ENT ECON	P = 2679.0 PSIG	T = 549.3 F	H = 545.7 BTU/LB
LVG SEC SH	P = 2403.9 PSIG	T = 1008.5 F	H = 1466.0 BTU/LB
ENT RH-1 ATTEMP	P = 545.1 PSIG	T = 625.4 F	H = 1309.9 BTU/LB
ENT RH-1	P = 545.1 PSIG	T = 622.0 F	H = 1307.8 BTU/LB
LVG RH-1	P = 504.8 PSIG	T = 1009.6 F	H = 1524.9 BTU/LB
NO. 1 HTR FW ENT	P = 2679.0 PSIG	T = 475.6 F	H = 460.0 BTU/LB
NO. 1 HTR FW LVG	P = 2679.0 PSIG	T = 544.1 F	H = 539.4 BTU/LB
NO. 1 HTR DRAIN	P = 1048.4 PSIG	T = 485.8 F	H = 471.1 BTU/LB
NO. 1 HTR EXTR	P = 1048.4 PSIG	T = 787.9 F	H = 1379.0 BTU/LB
NO. 2 HTR FW ENT	P = 2679.0 PSIG	T = 392.8 F	H = 370.5 BTU/LB
NO. 2 HTR FW LVG	P = 2679.0 PSIG	T = 475.6 F	H = 460.0 BTU/LB
NO. 2 HTR DRAIN	P = 530.5 PSIG	T = 402.0 F	H = 377.6 BTU/LB
NO. 2 HTR EXTR	P = 530.5 PSIG	T = 623.5 F	H = 1309.9 BTU/LB
RH-1 SPRAY	P = 745.1 PSIG	T = 92.3 F	H = 62.3 BTU/LB
CORR ENT RH-1	P = 545.1 PSIG	T = 622.6 F	H = 1308.2 BTU/LB
1st STAGE SPRAY	MEASURED 9.9	CALCULATED 27.5	USED C
2nd STAGE SPRAY	MEASURED 104.3	CALCULATED 112.9	USED C
RH-1 SPRAY	MEASURED 7.1	CALCULATED 8.5	USED M

FLOWS MLB/HR HEAT ABSORPTION MKB/HR

STEAM LVG SEC SH	= 6177.8	BOILER	= 3206.4
STEAM LVG PRI-2 SH	= 6065.0	BLOWDOWN HEAT	= 0.0
STEAM LVG PRI-1 SH	= 6037.5	EXTRACTION HEAT	= 0.0
FEEDWATER TO ECON	= 6037.5	SUPERHEATER	= 2511.6
BLOWDOWN	= 0.0	REHEATER 1	= 1100.1
SH EXTRACTION	= 0.0	REHEATER 2	= 0.0
STEAM LVG RH-1	= 5074.5	TOTAL OUTPUT	= 6818.1
STEAM ENT RH-1 ATTEMP	= 5067.4		
NO. 1 HTR. EXTR. FLOW	= 528.1		
NO. 2 HTR. EXTR. FLOW	= 526.6		
TURB LKG	= 55.7		

RB-615

31 Oct 1988

13:42:42

TEST NO 5A DATE 22Sep88 TIME START 1005 TIME END 1415

USING MEASURED FW FLOW  
 USING DATA CHOICE 1

DRUM, SAT FLUID	P = 2627.9 PSIG	T = 676.3 F	H = 749.9 BTU/LB
DRUM, SAT VAPOR	P = 2627.9 PSIG	T = 676.3 F	H = 1076.9 BTU/LB
DRUM, BLOWDOWN	P = 2627.9 PSIG	T = 676.3 F	H = 749.9 BTU/LB
SH SPRAY	P = 2777.9 PSIG	T = 342.5 F	H = 318.3 BTU/LB
ENT SEC.	P = 2524.4 PSIG	T = 776.5 F	H = 1277.1 BTU/LB
LVG PRI-2	P = 2524.4 PSIG	T = 783.6 F	H = 1284.5 BTU/LB
ENT PRI-2	P = 2557.1 PSIG	T = 717.4 F	H = 1197.1 BTU/LB
LVG PRI-1	P = 2557.1 PSIG	T = 719.7 F	H = 1200.9 BTU/LB
ENT ECON	P = 2677.9 PSIG	T = 548.3 F	H = 544.5 BTU/LB
LVG SEC SH	P = 2404.5 PSIG	T = 1008.7 F	H = 1466.0 BTU/LB
ENT RH-1 ATTEMP	P = 540.6 PSIG	T = 624.3 F	H = 1309.6 BTU/LB
ENT RH-1	P = 540.6 PSIG	T = 621.1 F	H = 1307.6 BTU/LB
LVG RH-1	P = 500.8 PSIG	T = 1009.6 F	H = 1525.1 BTU/LB
NO. 1 HTR FW ENT	P = 2677.9 PSIG	T = 474.5 F	H = 458.8 BTU/LB
NO. 1 HTR FW LVG	P = 2677.9 PSIG	T = 548.9 F	H = 545.2 BTU/LB
NO. 1 HTR DRAIN	P = 1035.4 PSIG	T = 496.8 F	H = 484.0 BTU/LB
NO. 1 HTR EXTR	P = 1035.4 PSIG	T = 794.3 F	H = 1383.7 BTU/LB
NO. 2 HTR FW ENT	P = 2677.9 PSIG	T = 392.1 F	H = 369.7 BTU/LB
NO. 2 HTR FW LVG	P = 2677.9 PSIG	T = 474.5 F	H = 458.8 BTU/LB
NO. 2 HTR DRAIN	P = 526.1 PSIG	T = 401.2 F	H = 376.7 BTU/LB
NO. 2 HTR EXTR	P = 526.1 PSIG	T = 622.6 F	H = 1309.7 BTU/LB
RH-1 SPRAY	P = 740.6 PSIG	T = 248.1 F	H = 218.1 BTU/LB
CORR ENT RH-1	P = 540.6 PSIG	T = 621.3 F	H = 1307.7 BTU/LB
1st STAGE SPRAY	MEASURED 9.4	CALCULATED 25.8	USED C
2nd STAGE SPRAY	MEASURED 34.2	CALCULATED 46.8	USED C
RH-1 SPRAY	MEASURED 8.6	CALCULATED 9.1	USED M

FLOWS MLB/HR	HEAT ABSORPTION MKB/HR
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STEAM LVG SEC SH	= 6142.0	BOILER	= 3231.4
STEAM LVG PRI-2 SH	= 6095.2	BLOWDOWN HEAT	= 0.0
STEAM LVG PRI-1 SH	= 6069.5	EXTRACTION HEAT	= 0.0
FEEDWATER TO ECON	= 6069.5	SUPERHEATER	= 2445.0
BLOWDOWN	= 0.0	REHEATER 1	= 1086.8
SH EXTRACTION	= 0.0	REHEATER 2	= 0.0
STEAM LVG RH-1	= 5000.0	TOTAL OUTPUT	= 6763.2
STEAM ENT RH-1 ATTEMP	= 4991.3		
NO. 1 HTR. EXTR. FLOW	= 582.9		
NO. 2 HTR. EXTR. FLOW	= 512.4		
TURB LKG	= 55.4		

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RB-615

31 Oct 1988

13:43:33

TEST NO 6A DATE 23Sep88 TIME START 1025 TIME END 1435

USING MEASURED FW FLOW  
USING DATA CHOICE 1

DRUM, SAT FLUID	P - 2627.9 PSIG	T - 676.3 F	H - 749.9 BTU/LB
DRUM, SAT VAPOR	P - 2627.9 PSIG	T - 676.3 F	H - 1076.9 BTU/LB
DRUM, BLOWDOWN	P - 2627.9 PSIG	T - 676.3 F	H - 749.9 BTU/LB
SH SPRAY	P - 2777.9 PSIG	T - 343.4 F	H - 319.2 BTU/LB
ENT SEC.	P - 2524.8 PSIG	T - 770.9 F	H - 1271.0 BTU/LB
LVG PRI-2	P - 2524.8 PSIG	T - 781.2 F	H - 1282.0 BTU/LB
ENT PRI-2	P - 2557.3 PSIG	T - 716.2 F	H - 1195.0 BTU/LB
LVG PRI-1	P - 2557.3 PSIG	T - 717.8 F	H - 1197.8 BTU/LB
ENT ECON	P - 2677.9 PSIG	T - 548.6 F	H - 544.8 BTU/LB
LVG SEC SH	P - 2405.4 PSIG	T - 1008.5 F	H - 1465.9 BTU/LB
ENT RH-1 ATTEMP	P - 542.1 PSIG	T - 624.8 F	H - 1309.8 BTU/LB
ENT RH-1	P - 542.1 PSIG	T - 621.6 F	H - 1307.8 BTU/LB
LVG RH-1	P - 502.1 PSIG	T - 1009.6 F	H - 1525.0 BTU/LB
NO. 1 HTR FW ENT	P - 2677.9 PSIG	T - 475.0 F	H - 459.3 BTU/LB
NO. 1 HTR FW LVG	P - 2677.9 PSIG	T - 549.2 F	H - 545.5 BTU/LB
NO. 1 HTR DRAIN	P - 1042.5 PSIG	T - 485.2 F	H - 470.5 BTU/LB
NO. 1 HTR EXTR	P - 1042.5 PSIG	T - 795.2 F	H - 1383.9 BTU/LB
NO. 2 HTR FW ENT	P - 2677.9 PSIG	T - 392.4 F	H - 370.0 BTU/LB
NO. 2 HTR FW LVG	P - 2677.9 PSIG	T - 475.0 F	H - 459.3 BTU/LB
NO. 2 HTR DRAIN	P - 527.5 PSIG	T - 401.5 F	H - 377.0 BTU/LB
NO. 2 HTR EXTR	P - 527.5 PSIG	T - 623.0 F	H - 1309.8 BTU/LB
RH-1 SPRAY	P - 742.1 PSIG	T - 246.8 F	H - 216.8 BTU/LB
CORR ENT RH-1	P - 542.1 PSIG	T - 621.2 F	H - 1307.5 BTU/LB
1st STAGE SPRAY	MEASURED 8.9	CALCULATED 18.9	USED C
2nd STAGE SPRAY	MEASURED 58.3	CALCULATED 69.7	USED C
RH-1 SPRAY	MEASURED 10.4	CALCULATED 9.2	USED M

FLOWS MLB/HR HEAT ABSORPTION MKB/HR

STEAM LVG SEC SH	- 6142.8	BOILER	- 3221.6
STEAM LVG PRI-2 SH	- 6073.1	BLOWDOWN HEAT	- 0.0
STEAM LVG PRI-1 SH	- 6054.2	EXTRACTION HEAT	- 0.0
FEEDWATER TO ECON	- 6054.2	SUPERHEATER	- 2456.7
BLOWDOWN	- 0.0	REHEATER 1	- 1088.5
SH EXTRACTION	- 0.0	REHEATER 2	- 0.0
STEAM LVG RH-1	- 5004.2	TOTAL OUTPUT	- 6766.8
STEAM ENT RH-1 ATTEMP	- 4993.8		
NO. 1 HTR. EXTR. FLOW	- 571.5		
NO. 2 HTR. EXTR. FLOW	- 522.1		
TURB LKG	- 55.4		

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RB-615

31 Oct 1988

13:44:33

TEST NO 7A1 DATE 26Sep88 TIME START 2355 TIME END 0040

USING MEASURED FW FLOW  
USING DATA CHOICE 1

DRUM, SAT FLUID	P - 2432.7 PSIG	T = 665.0 F	H = 724.9 BTU/LB
DRUM, SAT VAPOR	P - 2432.7 PSIG	T = 665.0 F	H = 1098.9 BTU/LB
DRUM, BLOWDOWN	P - 2432.7 PSIG	T = 665.0 F	H = 724.9 BTU/LB
SH SPRAY	P - 2582.7 PSIG	T = 308.4 F	H = 283.0 BTU/LB
ENT SEC.	P - 2417.6 PSIG	T = 762.5 F	H = 1270.8 BTU/LB
LVG PRI-2	P - 2417.6 PSIG	T = 767.9 F	H = 1276.5 BTU/LB
ENT PRI-2	P - 2422.4 PSIG	T = 702.5 F	H = 1190.6 BTU/LB
LVG PRI-1	P - 2422.4 PSIG	T = 704.3 F	H = 1193.5 BTU/LB
ENT ECON	P - 2482.7 PSIG	T = 473.7 F	H = 457.7 BTU/LB
LVG SEC SH	P - 2400.0 PSIG	T = 999.8 F	H = 1460.3 BTU/LB
ENT RH-1 ATTEMP	P - 271.0 PSIG	T = 543.7 F	H = 1285.0 BTU/LB
ENT RH-1	P - 271.0 PSIG	T = 541.2 F	H = 1283.5 BTU/LB
LVG RH-1	P - 250.7 PSIG	T = 993.2 F	H = 1523.6 BTU/LB
NO. 1 HTR FW ENT	P - 2482.7 PSIG	T = 411.2 F	H = 389.7 BTU/LB
NO. 1 HTR FW LVG	P - 2482.7 PSIG	T = 474.3 F	H = 458.5 BTU/LB
NO. 1 HTR DRAIN	P - 514.6 PSIG	T = 391.7 F	H = 366.5 BTU/LB
NO. 1 HTR EXTR	P - 514.6 PSIG	T = 691.2 F	H = 1351.0 BTU/LB
NO. 2 HTR FW ENT	P - 2482.7 PSIG	T = 341.2 F	H = 316.4 BTU/LB
NO. 2 HTR FW LVG	P - 2482.7 PSIG	T = 411.2 F	H = 389.7 BTU/LB
NO. 2 HTR DRAIN	P - 263.6 PSIG	T = 346.0 F	H = 317.8 BTU/LB
NO. 2 HTR EXTR	P - 263.6 PSIG	T = 542.0 F	H = 1284.7 BTU/LB
RH-1 SPRAY	P - 471.0 PSIG	T = 111.9 F	H = 81.1 BTU/LB
CORR ENT RH-1	P - 271.0 PSIG	T = 537.2 F	H = 1281.2 BTU/LB
1st STAGE SPRAY	MEASURED 6.3	CALCULATED 9.7	USED C
2nd STAGE SPRAY	MEASURED 0.0	CALCULATED 17.2	USED C
RH-1 SPRAY	MEASURED 7.9	CALCULATED 3.0	USED M

FLOWS MLB/HR HEAT ABSORPTION MKB/HR

STEAM LVG SEC SH	- 2976.5	BOILER	- 1891.2
STEAM LVG PRI-2 SH	- 2959.3	BLOWDOWN HEAT	- 0.0
STEAM LVG PRI-1 SH	- 2949.6	EXTRACTION HEAT	- 0.0
FEEDWATER TO ECON	- 2949.6	SUPERHEATER	- 1097.8
BLOWDOWN	- 0.0	REHEATER 1	- 614.4
SH EXTRACTION	- 0.0	REHEATER 2	- 0.0
STEAM LVG RH-1	- 2534.9	TOTAL OUTPUT	- 3603.3
STEAM ENT RH-1 ATTEMP	- 2526.9		
NO. 1 HTR. EXTR. FLOW	- 205.9		
NO. 2 HTR. EXTR. FLOW	- 213.2		
TURB LKG	- 30.5		

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RB-615

31 Oct 1988

13:45:27

TEST NO 7A2 DATE 26Sep88 TIME START 0240 TIME END 0355

USING MEASURED FW FLOW  
 USING DATA CHOICE 1

DRUM, SAT FLUID	P = 2440.2 PSIG	T = 665.4 F	H = 725.9 BTU/LB
DRUM, SAT VAPOR	P = 2440.2 PSIG	T = 665.4 F	H = 1098.1 BTU/LB
DRUM, BLOWDOWN	P = 2440.2 PSIG	T = 665.4 F	H = 725.9 BTU/LB
SH SPRAY	P = 2590.2 PSIG	T = 289.6 F	H = 263.9 BTU/LB
ENT SEC.	P = 2424.4 PSIG	T = 755.9 F	H = 1262.9 BTU/LB
LVG PRI-2	P = 2424.4 PSIG	T = 761.0 F	H = 1268.5 BTU/LB
ENT PRI-2	P = 2429.4 PSIG	T = 696.6 F	H = 1179.0 BTU/LB
LVG PRI-1	P = 2429.4 PSIG	T = 698.0 F	H = 1181.6 BTU/LB
ENT ECON	P = 2490.2 PSIG	T = 474.7 F	H = 458.9 BTU/LB
LVG SEC SH	P = 2406.1 PSIG	T = 1002.1 F	H = 1461.6 BTU/LB
ENT RH-1 ATTEMP	P = 271.6 PSIG	T = 544.0 F	H = 1285.1 BTU/LB
ENT RH-1	P = 271.6 PSIG	T = 541.5 F	H = 1283.7 BTU/LB
LVG RH-1	P = 251.5 PSIG	T = 964.9 F	H = 1508.7 BTU/LB
NO. 1 HTR FW ENT	P = 2490.2 PSIG	T = 411.4 F	H = 390.0 BTU/LB
NO. 1 HTR FW LVG	P = 2490.2 PSIG	T = 475.4 F	H = 459.6 BTU/LB
NO. 1 HTR DRAIN	P = 518.9 PSIG	T = 415.4 F	H = 392.1 BTU/LB
NO. 1 HTR EXTR	P = 518.9 PSIG	T = 693.9 F	H = 1352.3 BTU/LB
NO. 2 HTR FW ENT	P = 2490.2 PSIG	T = 341.0 F	H = 316.2 BTU/LB
NO. 2 HTR FW LVG	P = 2490.2 PSIG	T = 411.4 F	H = 390.0 BTU/LB
NO. 2 HTR DRAIN	P = 264.2 PSIG	T = 345.8 F	H = 317.6 BTU/LB
NO. 2 HTR EXTR	P = 264.2 PSIG	T = 542.3 F	H = 1284.8 BTU/LB
RH-1 SPRAY	P = 471.6 PSIG	T = 108.8 F	H = 78.1 BTU/LB
CORR ENT RH-1	P = 271.6 PSIG	T = 537.5 F	H = 1281.3 BTU/LB
1st STAGE SPRAY	MEASURED 7.2	CALCULATED 8.4	USED C
2nd STAGE SPRAY	MEASURED 0.0	CALCULATED 16.9	USED C
RH-1 SPRAY	MEASURED 7.9	CALCULATED 3.0	USED M

FLOWS	MLB/HR	HEAT ABSORPTION	MKB/HR
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STEAM LVG SEC SH	- 2992.0	BOILER	- 1896.5
STEAM LVG PRI-2 SH	- 2975.1	BLOWDOWN HEAT	- 0.0
STEAM LVG PRI-1 SH	- 2966.8	EXTRACTION HEAT	- 0.0
FEEDWATER TO ECON	- 2966.8	SUPERHEATER	- 1108.7
BLOWDOWN	- 0.0	REHEATER 1	- 578.5
SH EXTRACTION	- 0.0	REHEATER 2	- 0.0
STEAM LVG RH-1	- 2544.4	TOTAL OUTPUT	- 3583.7
STEAM ENT RH-1 ATTEMP	- 2536.5		
NO. 1 HTR. EXTR. FLOW	- 215.2		
NO. 2 HTR. EXTR. FLOW	- 209.7		
TURB LKG	- 30.6		

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RB-615

31 Oct 1988

13:46:25

TEST NO 8A DATE 26Sep88 TIME START 0515 TIME END 0715

USING MEASURED FW FLOW  
USING DATA CHOICE 1

DRUM, SAT FLUID	P = 2508.3 PSIG	T = 669.5 F	H = 734.6 BTU/LB
DRUM, SAT VAPOR	P = 2508.3 PSIG	T = 669.5 F	H = 1090.8 BTU/LB
DRUM, BLOWDOWN	P = 2508.3 PSIG	T = 669.5 F	H = 734.6 BTU/LB
SH SPRAY	P = 2658.3 PSIG	T = 320.8 F	H = 295.8 BTU/LB
ENT SEC.	P = 2460.2 PSIG	T = 747.2 F	H = 1249.5 BTU/LB
LVG PRI-2	P = 2460.2 PSIG	T = 774.4 F	H = 1279.9 BTU/LB
ENT PRI-2	P = 2475.4 PSIG	T = 702.0 F	H = 1182.0 BTU/LB
LVG PRI-1	P = 2475.4 PSIG	T = 703.9 F	H = 1185.3 BTU/LB
ENT ECON	P = 2558.3 PSIG	T = 515.1 F	H = 504.9 BTU/LB
LVG SEC SH	P = 2404.4 PSIG	T = 1006.9 F	H = 1464.9 BTU/LB
ENT RH-1 ATTEMP	P = 402.5 PSIG	T = 583.7 F	H = 1296.3 BTU/LB
ENT RH-1	P = 402.5 PSIG	T = 581.3 F	H = 1294.9 BTU/LB
LVG RH-1	P = 372.1 PSIG	T = 1013.2 F	H = 1530.6 BTU/LB
NO. 1 HTR FW ENT	P = 2558.3 PSIG	T = 447.0 F	H = 428.4 BTU/LB
NO. 1 HTR FW LVG	P = 2558.3 PSIG	T = 516.0 F	H = 506.0 BTU/LB
NO. 1 HTR DRAIN	P = 764.7 PSIG	T = 453.4 F	H = 434.2 BTU/LB
NO. 1 HTR EXTR	P = 764.7 PSIG	T = 742.0 F	H = 1366.2 BTU/LB
NO. 2 HTR FW ENT	P = 2558.3 PSIG	T = 370.3 F	H = 346.7 BTU/LB
NO. 2 HTR FW LVG	P = 2558.3 PSIG	T = 447.0 F	H = 428.4 BTU/LB
NO. 2 HTR DRAIN	P = 392.0 PSIG	T = 376.8 F	H = 350.5 BTU/LB
NO. 2 HTR EXTR	P = 392.0 PSIG	T = 582.1 F	H = 1296.3 BTU/LB
RH-1 SPRAY	P = 602.5 PSIG	T = 106.7 F	H = 76.3 BTU/LB
CORR ENT RH-1	P = 402.5 PSIG	T = 579.4 F	H = 1293.7 BTU/LB
1st STAGE SPRAY	MEASURED 8.6	CALCULATED 15.6	USED C
2nd STAGE SPRAY	MEASURED 128.0	CALCULATED 136.2	USED C
RH-1 SPRAY	MEASURED 7.9	CALCULATED 4.3	USED M

FLOWS MLB/HR HEAT ABSORPTION MKB/HR

STEAM LVG SEC SH	= 4411.1	BOILER	= 2495.3
STEAM LVG PRI-2 SH	= 4274.9	BLOWDOWN HEAT	= 0.0
STEAM LVG PRI-1 SH	= 4259.2	EXTRACTION HEAT	= 0.0
FEEDWATER TO ECON	= 4259.2	SUPERHEATER	= 1771.0
BLOWDOWN	= 0.0	REHEATER 1	= 873.5
SH EXTRACTION	= 0.0	REHEATER 2	= 0.0
STEAM LVG RH-1	= 3686.9	TOTAL OUTPUT	= 5139.8
STEAM ENT RH-1 ATTEMP	= 3679.0		
NO. 1 HTR. EXTR. FLOW	= 354.5		
NO. 2 HTR. EXTR. FLOW	= 336.4		
TURB LKG	= 41.3		

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**IP14\_000685**

APPENDIX 4  
GAS SAMPLING GRID TRAVERSE DATA

IP14\_000686

BABCOCK AND WILCOX CO.  
DENVER FIELD SERVICE

TO: CHUCK FINNEGAN; IPP

FROM: J. MIHALICH, JR.; B&W SERVICE

RE: RB-615; GAS GRID FECHHEIMER TRAVERSES

DATE: 05/25/88

THE FECHHEIMER TRAVERSES AT THE COMPOSITE GAS GRID LOCATIONS HAVE BEEN COMPLETED. LISTED BELOW ARE THE WEIGHTED AND ARITHMETIC AVERAGES FOR TEMPERATURE AND O2 BY DUCT.

LOCATION	TEMPERATURE AVERAGE ARITHMETIC	TEMPERATURE AVERAGE WEIGHTED	O2 AVERAGE ARITHMETIC	O2 AVERAGE WEIGHTED
EAST ECON OUT	723	725	4.2%	4.2%
WEST ECON OUT	724	727	4.3%	4.3%
EAST PRI GAS IN	716	717	3.1%	3.0%
WEST PRI GAS IN	706	706	3.3%	3.3%
EAST PRI GAS OUT	291	290	6.6%	6.8%
WEST PRI GAS OUT	306	305	6.0%	6.0%
EAST BAG GAS IN	286	286	4.8%	4.9%
CENTER BAG GAS IN	311	311	4.2%	4.2%
WEST BAG GAS IN	295	295	5.5%	5.6%

AS CAN BE SEEN FROM THE DATA, THE DIFFERENCE BETWEEN THE WEIGHTED AND ARITHMETIC AVERAGES IS QUITE SMALL. THERE SHOULD BE NO PROBLEM IN USING COMPOSITE GAS GRIDS AT ANY OF THESE LOCATIONS.

ALL CALCULATED DATA SHEETS ARE LOCATED IN APPENDIX A. THIS DATA WAS REDUCED USING THE SAME SOFTWARE AND METHODS AS THE UNIT #1 AIRHEATER TEST OF 6/87. RAW DATA SHEETS ARE IN APPENDIX B AND THE ORIGINAL DATA SHEETS CAN BE SUPPLIED UPON REQUEST.

IF YOU HAVE ANY QUESTIONS OR NEED ADDITIONAL INFORMATION,  
PLEASE CONTACT ME AT X-5395.

CC: TC HEIL; B&W BARBERTON  
DC LANGLEY; B&W DENVER  
FJ MC GINLEY; B&W DENVER  
PHIL TICE; IPSC  
AARON NISSEN; IPSC  
FILE

APPENDIX A

DATE = 5/21/88  
 LOCATION = EAST ECON OUTLET  
 FILE IDENTITY = EAST\_ECON  
 BAROMETRIC PRESSURE = 25.48  
 PROBE IDENTITY = E-8  
 PROBE COEFF A0 = 1.10640E+00  
 PROBE COEFF A1 = 4.40463E-06  
 PROBE COEFF A2 = -9.96281E-11  
 PROBE COEFF A3 = 1.87291E-15  
 PROBE COEFF A4 = -1.81710E-20  
 DUCT AREA = 848.0

NOTE: ALL CO2 VALUES ARE CALCULATED & BASED ON FUEL AND MEASURED O2

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTD % O2	WTD %CO2	WTD TE
1	1	2321	4.1	15.0	.84	3.5	12.7	51
1	2	4059	3.9	15.2	1.48	5.8	22.5	100
1	3	3814	4.2	15.0	1.39	5.8	20.7	95
1	4	3145	4.8	14.4	1.14	5.5	16.5	81
1	5	3404	5.2	14.1	1.24	6.4	17.4	81
1	6	3197	5.3	14.0	1.16	6.2	16.2	81
1	7	2950	5.4	13.9	1.07	5.8	14.9	71

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTD % O2	WTD %CO2	WTD TE
2	1	1713	4.0	15.1	.82	2.5	9.4	41
2	2	4216	3.6	15.5	1.53	5.5	23.7	100
2	3	3759	3.9	15.2	1.37	5.3	20.8	83
2	4	3245	4.7	14.5	1.18	5.5	17.1	83
2	5	3148	4.9	14.3	1.14	5.6	16.4	83
2	6	3300	5.2	14.1	1.20	6.2	16.9	83
2	7	3160	5.2	14.1	1.15	6.0	16.2	84

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTD % O2	WTD %CO2	WTD TE
3	1	1416	4.3	14.9	.51	2.2	7.7	75
3	2	3788	4.1	15.0	1.38	5.6	20.7	97
3	3	3895	3.7	15.4	1.42	5.2	21.8	100
3	4	3763	4.2	15.0	1.37	5.7	20.5	95
3	5	3305	4.6	14.6	1.20	5.5	17.5	86
3	6	3366	4.9	14.3	1.22	6.0	17.5	86
3	7	2799	5.0	14.2	1.02	5.1	14.5	745

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTD % O2	WTD %CO2	WTD TE
4	1	1035	4.0	15.1	.38	1.5	5.7	266
4	2	2381	4.1	15.0	.87	3.5	13.0	61
4	3	3759	4.1	15.0	1.37	5.6	20.6	95
4	4	3462	4.0	15.1	1.26	5.0	19.0	83
4	5	3375	4.4	14.8	1.23	5.4	18.1	83
4	6	3372	4.5	14.7	1.23	5.5	18.0	83
4	7	2488	4.9	14.3	.90	4.4	13.0	666

TAP	POINT	CORR	V	%O2	% CO2	V LOC/AVG	WTD	% O2	WTD %CO2	WTD	TEMP
5	1	1349	4.2	15.0	.49	2.1		7.3		343	
5	2	1407	3.8	15.3	.51	1.9		7.8		368	
5	3	3537	3.7	15.4	1.29		4.8	19.8		836	
5	4	3154	4.2	15.0	1.15		4.8	17.1		819	
5	5	3491	4.6	14.6	1.27		5.8	18.5		918	
5	6	3473	5.1	14.2	1.26		6.4	17.9		941	
5	7	2693	5.7	13.6	.98		5.6	13.3		718	

TAP	POINT	CORR	V	%O2	% CO2	V LOC/AVG	WTD	% O2	WTD %CO2	WTD	TEMP
6	1	1361	3.9	15.2	.49		1.9	7.5		353	
6	2	799	4.2	15.0	.29		1.2	4.3		211	
6	3	3974	3.9	15.2	1.44		5.6	22.0		1025	
6	4	3874	4.1	15.0	1.41		5.8	21.2		1014	
6	5	3240	4.5	14.7	1.18		5.3	17.3		856	
6	6	3307	5.3	14.0	1.20		6.4	16.8		903	
6	7	2563	5.7	13.6	.93		5.3	12.7		684	

TAP	POINT	CORR	V	%O2	% CO2	V LOC/AVG	WTD	% O2	WTD %CO2	WTD	TEMP
7	1	1324	4.7	14.5	.48		2.3	7.0		323	
7	2	1359	4.2	15.0	.49		2.1	7.4		35	
7	3	4093	3.7	15.4	1.49		5.5	22.9		1051	
7	4	3699	3.9	15.2	1.34		5.2	20.5		377	
7	5	3365	4.4	14.8	1.22		5.4	18.1		923	
7	6	2860	4.7	14.5	1.04		4.9	15.1		793	
7	7	2358	5.2	14.1	.86		4.5	12.1		647	

TAP	POINT	CORR	V	%O2	% CO2	V LOC/AVG	WTD	% O2	WTD %CO2	WTD	TEMP
8	1	1479	3.7	15.4	.54		2.0	8.3		376	
8	2	1538	3.6	15.5	.56		2.0	8.7		387	
8	3	3753	3.9	15.2	1.36		5.3	20.8		970	
8	4	2882	3.7	15.4	1.05		3.9	16.1		764	
8	5	2811	4.4	14.8	1.02		4.5	15.1		772	
8	6	2892	4.9	14.3	1.05		5.2	15.1		802	
8	7	1998	5.2	14.1	.73		3.8	10.2		547	

TAP	POINT	CORR	V	%O2	% CO2	V LOC/AVG	WTD	% O2	WTD %CO2	WTD	TEMP
9	1	1536	3.7	15.4	.56		2.1	8.6		395	
9	2	932	3.7	15.4	.34		1.3	5.2		241	
9	3	3788	3.4	15.7	1.38		4.7	21.6		964	
9	4	3376	3.5	15.6	1.23		4.3	19.1		900	
9	5	3150	3.8	15.3	1.15		4.4	17.5		863	
9	6	2449	4.8	14.4	.89		4.3	12.8		670	
9	7	791	5.5	13.8	.29		1.6	4.0		215	

TAP	POINT	CORR	V	%O2	% CO2	V LOC/AVG	WTD	% O2	WTD %CO2	WTD	TEMP
10	1	1487	3.8	15.3	.54		2.1	8.3		384	
10	2	1382	3.6	15.5	.50		1.8	7.8		361	
10	3	3909	3.6	15.5	1.42		5.1	22.0		1025	
10	4	3602	3.3	15.8	1.31		4.3	20.6		962	
10	5	3224	3.5	15.6	1.17		4.1	18.3		673	
10	6	2455	4.1	15.0	.89		3.7	13.4		670	
10	7	1232	4.9	14.3	.45		2.2	6.4		533	

TAP	POINT	CORR	V	%O2	% CO2	V	LOC/AVG	WTD	% O2	WTD	%CO2	WTD	TEMP
11	1	1650	4.0	15.1	.60	2.4		9.1		410			
11	2	935	3.8	15.3	.34	1.3		5.2		244			
11	3	3776	3.5	15.6	1.37	4.8		21.4		991			
11	4	3507	3.4	15.7	1.27	4.3		20.0		932			
11	5	3156	3.5	15.6	1.15	4.0		17.9		853			
11	6	3314	4.0	15.1	1.20	4.8		18.2		899			
11	7	1994	4.7	14.5	.72	3.4		10.5		533			

TAP	POINT	CORR	V	%O2	% CO2	V	LOC/AVG	WTD	% O2	WTD	%CO2	WTD	TEMP
12	1	1575	3.9	15.2	.57	2.2		8.7		410			
12	2	1248	3.9	15.2	.45	1.8		6.9		323			
12	3	3866	3.9	15.2	1.41	5.5		21.4		1004			
12	4	3447	3.6	15.5	1.25	4.5		19.4		899			
12	5	3602	3.5	15.6	1.31	4.6		20.4		974			
12	6	3559	3.7	15.4	1.29	4.8		19.9		853			
12	7	2767	4.0	15.1	1.01	4.0		15.2		744			

TAP	POINT	CORR	V	%O2	% CO2	V	LOC/AVG	WTD	% O2	WTD	%CO2	WTD	TEMP
13	1	1398	4.1	15.0	.51	2.1		7.6		346			
13	2	1415	3.4	15.7	.51	1.7		8.1		353			
13	3	1446	3.5	15.6	.53	1.8		8.2		381			
13	4	3751	3.2	15.8	1.36	4.4		21.6		981			
13	5	3622	3.3	15.8	1.32	4.3		20.7		954			
13	6	3721	4.4	14.8	1.35	6.0		20.0		1004			
13	7	3587	4.7	14.5	1.30	6.1		18.9		954			

TAP	POINT	CORR	V	%O2	% CO2	V	LOC/AVG	WTD	% O2	WTD	%CO2	WTD	TEMP
14	1	1308	3.2	15.8	.48	1.5		7.5		321			
14	2	1312	3.7	15.4	.48	1.8		7.3		322			
14	3	1067	3.3	15.8	.39	1.3		6.1		277			
14	4	3818	3.4	15.7	1.39	4.7		21.7		971			
14	5	3816	3.3	15.8	1.39	4.6		21.9		955			
14	6	3749	3.7	15.4	1.36	5.0		21.0		1013			
14	7	1582	4.1	15.0	.58	2.4		8.6		411			

LOCATION = EAST\_ECON\_OUTLET  
FILE IDENTITY = EAST\_ECON

AVERAGE VELOCITY = 2751 FPM

AVERAGE (WEIGHTED) % O2 = 4.2

AVERAGE (WEIGHTED) % CO2 = 15.0

AVERAGE (WEIGHTED) TEMPERATURE = 725

AVERAGE (ARITHMATIC) % O2 = 4.2

AVERAGE (ARITHMATIC) % CO2 = 15.0

AVERAGE (ARITHMATIC) TEMPERATURE = 723

AVERAGE STATIC PRESSURE (in. H2O) = -2.0

AVERAGE DENSITY (LBM/FT^3) = .02902

ACFM (ACTUAL FT^3/MIN) = 2332607

LB/HR (WET) = 4062213

DATE = 5/20/88  
 LOCATION = ECON OUTLET WEST  
 FILE IDENTITY = WECON  
 BAROMETRIC PRESSURE = 25.46  
 PROBE IDENTITY = E-8  
 PROBE COEFF A0 = 1.10640E+00  
 PROBE COEFF A1 = 4.40463E-06  
 PROBE COEFF A2 = -9.96281E-11  
 PROBE COEFF A3 = 1.87291E-15  
 PROBE COEFF A4 = -1.81710E-20  
 DUCT AREA = 850.0

NOTE: ALL CO2 VALUES ARE CALCULATED & BASED ON FUEL AND MEASURED O2

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTD % O2	WTD %CO2	WTD TEMP
1	1	906	3.8	15.3	.32	1.2	4.9	303
1	2	659	3.8	15.3	.23	.9	3.6	162
1	3	2162	3.3	15.8	.77	2.5	12.1	522
1	4	4165	3.2	15.8	1.48	4.7	23.5	105
1	5	3794	4.0	15.1	1.35	5.4	20.4	924
1	6	3237	3.6	15.5	1.15	4.1	17.8	851
1	7	2512	4.0	15.1	.89	3.6	13.5	663

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTD % O2	WTD %CO2	WTD TEMP
2	1	589	4.5	14.7	.21	.9	3.1	142
2	2	592	3.5	15.6	.21	.7	3.3	140
2	3	1300	3.1	15.9	.46	1.4	7.4	326
2	4	3776	2.8	16.2	1.34	3.8	21.7	923
2	5	3550	3.3	15.8	1.26	4.2	19.9	905
2	6	3249	3.8	15.3	1.15	4.4	17.7	847
2	7	3109	4.1	15.0	1.11	4.5	16.6	812

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTD % O2	WTD %CO2	WTD TEMP
3	1	655	3.8	15.3	.23	.9	3.6	157
3	2	450	3.4	15.7	.16	.5	2.5	115
3	3	3781	3.3	15.8	1.34	4.4	21.2	955
3	4	3574	3.4	15.7	1.27	4.3	19.9	903
3	5	2793	4.0	15.1	.99	4.0	15.0	722
3	6	2892	4.5	14.7	1.03	4.6	15.1	771
3	7	3427	4.8	14.4	1.22	5.8	17.6	915

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTD % O2	WTD %CO2	WTD TEMP
4	1	390	4.0	15.1	.14	.6	2.1	99
4	2	1323	4.2	15.0	.47	2.0	7.0	340
4	3	4310	3.9	15.2	1.53	6.0	23.3	1102
4	4	3946	4.2	15.0	1.40	5.9	21.0	1018
4	5	2967	4.8	14.4	1.05	5.1	15.2	781
4	6	2834	4.8	14.4	1.01	4.8	14.5	754
4	7	3059	4.5	14.7	1.09	4.9	16.0	812

TAP	POINT	CORR	V	%O2	% CO2	V	LOC/AVG	WTD	% O2	WTD %CO2	WTD	TE
5	1	668	4.0	15.1	.24	.9	3.6	173				
5	2	1402	4.1	15.0	.50	2.0	7.5	356				
5	3	4118	3.9	15.2	1.46	5.7	22.3	104				
5	4	3665	4.4	14.8	1.30	5.7	19.2	947				
5	5	3502	4.8	14.4	1.24	6.0	17.9	911				
5	6	2624	3.9	15.2	.93	3.6	14.2	682				
5	7	2170	4.1	15.0	.77	3.2	11.6	561				

TAP	POINT	CORR	V	%O2	% CO2	V	LOC/AVG	WTD	% O2	WTD %CO2	WTD	TE
6	1	934	4.1	15.0	.33	1.4	5.0	22				
6	2	1221	3.8	15.3	.43	1.6	6.6	362				
6	3	3759	4.0	15.1	1.34	5.3	20.2	95				
6	4	3124	4.2	15.0	1.11	4.7	16.6	86				
6	5	3354	4.5	14.7	1.19	5.4	17.5	80				
6	6	2270	5.1	14.2	.81	4.1	11.4	71				
6	7	1863	4.9	14.3	.66	3.2	9.5	64				

TAP	POINT	CORR	V	%O2	% CO2	V	LOC/AVG	WTD	% O2	WTD %CO2	WTD	TE
7	1	848	4.1	15.0	.30	1.2	4.5	22				
7	2	784	4.2	15.0	.28	1.2	4.2	22				
7	3	4264	3.8	15.3	1.52	5.8	23.2	10				
7	4	3145	4.1	15.0	1.12	4.6	16.8	86				
7	5	3290	5.0	14.2	1.17	5.8	16.7	80				
7	6	2884	4.7	14.5	1.03	4.8	14.9	71				
7	7	2595	5.2	14.1	.92	4.8	13.0	64				

TAP	POINT	CORR	V	%O2	% CO2	V	LOC/AVG	WTD	% O2	WTD %CO2	WTD	TE
8	1	783	4.0	15.1	.28	1.1	4.2	22				
8	2	2816	4.0	15.1	1.00	4.0	15.1	22				
8	3	4290	3.7	15.4	1.52	5.6	23.5	10				
8	4	3962	4.2	15.0	1.41	5.9	21.1	107				
8	5	3484	4.6	14.6	1.24	5.7	18.1	97				
8	6	3371	5.0	14.2	1.20	6.0	17.1	92				
8	7	2926	5.4	13.9	1.04	5.6	14.4	76				

TAP	POINT	CORR	V	%O2	% CO2	V	LOC/AVG	WTD	% O2	WTD %CO2	WTD	TE
9	1	987	3.7	15.4	.35	1.3	5.4	252				
9	2	1986	3.9	15.2	.71	2.8	10.7	58				
9	3	3783	4.1	15.0	1.34	5.5	20.2	94				
9	4	3268	4.1	15.0	1.16	4.8	17.5	84				
9	5	3273	4.9	14.3	1.16	5.7	16.7	85				
9	6	3397	5.0	14.2	1.21	6.0	17.2	90				
9	7	3009	5.2	14.1	1.07	5.6	15.0	80				

TAP	POINT	CORR	V	%O2	% CO2	V	LOC/AVG	WTD	% O2	WTD %CO2	WTD	TE
10	1	986	3.7	15.4	.35	1.3	5.4	252				
10	2	2308	3.9	15.2	.82	3.2	12.5	586				
10	3	3773	3.6	15.5	1.34	4.8	20.8	95				
10	4	3588	3.9	15.2	1.28	5.0	19.4	915				
10	5	3115	4.4	14.8	1.11	4.9	16.4	824				
10	6	3410	5.1	14.2	1.21	6.2	17.2	882				
10	7	3161	4.9	14.3	1.12	5.5	16.1	834				

TAP	POINT	CORR	V	% CO2	% CO2	V	LOC/AVG	WTD % CO2	WTD % CO2	WTD % CO2	WTD TEMP
11	1	1153	3.5	15.6	.41	1.4		6.4		29.1	
11	2	3730	3.4	15.7	1.33	4.5		20.8		94.1	
11	3	3790	3.6	15.5	1.35	4.9		20.9		95.8	
11	4	4078	4.2	15.0	1.45	6.1		21.7		104.8	
11	5	3751	4.8	14.4	1.33	6.4		19.2		97.4	
11	6	3397	5.3	14.0	1.21	6.4		16.9		89.5	
11	7	2565	5.6	13.7	.91	5.1		12.5		67.9	

TAP	POINT	CORR	V	% CO2	% CO2	V	LOC/AVG	WTD % CO2	WTD % CO2	WTD TEMP	
12	1	1246	5.5	13.8	.44	2.4		6.1		30.1	
12	2	3759	3.8	15.3	1.34	5.1		20.5		94.5	
12	3	3944	4.1	15.0	1.40	5.7		21.1		99.7	
12	4	3354	4.3	14.9	1.19	5.1		17.7		85.5	
12	5	3607	4.9	14.3	1.28	6.3		18.4		93.8	
12	6	3532	5.6	13.7	1.26	7.0		17.2		93.1	
12	7	2744	5.9	13.4	.98	5.8		13.1		71.5	

TAP	POINT	CORR	V	% CO2	% CO2	V	LOC/AVG	WTD % CO2	WTD % CO2	WTD TEMP	
13	1	1826	3.8	15.3	.65	2.5		9.9		45.2	
13	2	4053	3.3	15.8	1.44	4.8		22.7		101.1	
13	3	3854	3.5	15.6	1.37	4.8		21.3		98.1	
13	4	4259	4.4	14.8	1.51	6.7		22.4		103.1	
13	5	3866	5.4	13.9	1.37	7.4		19.1		101.1	
13	6	4532	6.2	13.2	1.61	10.0		21.2		116.8	
13	7	4796	6.5	12.9	1.70	11.1		22.0		128.4	

LOCATION = ECON OUTLET WEST  
FILE IDENTITY = WECON

AVERAGE VELOCITY = 2813 FPM

AVERAGE (WEIGHTED) % O2 = 4.3  
AVERAGE (WEIGHTED) % CO2 = 14.8  
AVERAGE (WEIGHTED) TEMPERATURE = 727

AVERAGE (ARITHMETIC) % O2 = 4.3  
AVERAGE (ARITHMETIC) % CO2 = 14.9  
AVERAGE (ARITHMETIC) TEMPERATURE = 724

AVERAGE STATIC PRESSURE (in. H2O) = -2.0  
AVERAGE DENSITY (LBM/FT^3) = .02898

ACFM (ACTUAL FT^3/MIN) = 2391197  
LB/HR (WET) = 4158482

DATE = 5/19/88  
 LOCATION = EAST PRI GAS INLET  
 FILE IDENTITY = E\_PAGI  
 BAROMETRIC PRESSURE = 25.32  
 PROBE IDENTITY = E-1  
 PROBE COEFF A0 = 1.17088E+00  
 PROBE COEFF A1 = -4.30409E-06  
 PROBE COEFF A2 = 1.54069E-10  
 PROBE COEFF A3 = -1.65099E-15  
 PROBE COEFF A4 = 2.82564E-21  
 DUCT AREA = 162.0

NOTE: ALL CO2 VALUES ARE CALCULATED & BASED ON FUEL AND MEASURED O2

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTD % O2	WTD %CO2	WTD
1	1	336	3.1	15.9	.17	.5	2.6	
1	2	476	3.0	16.0	.23	.7	3.7	
1	3	1204	2.9	16.1	.59	1.7	9.5	
2	1	1312	3.2	15.8	.64	2.1	10.2	
2	2	977	3.5	15.6	.48	1.7	7.5	
2	3	2251	3.0	16.0	1.10	3.3	17.7	
3	1	2724	3.2	15.8	1.34	4.3	21.2	
3	2	2350	3.0	16.0	1.15	3.5	18.5	
3	3	2196	3.1	15.9	1.08	3.3	17.2	
4	1	2078	3.0	16.0	1.02	3.1	16.3	
4	2	2833	2.9	16.1	1.39	4.0	22.4	
4	3	2358	3.0	16.0	1.16	3.5	18.5	
5	1	2284	3.0	16.0	1.12	3.4	18.0	82
5	2	2793	2.9	16.1	1.37	4.0	22.1	93
5	3	2665	3.1	15.9	1.31	4.1	20.8	94
6	1	2511	3.4	15.7	1.23	4.2	19.3	83
6	2	2549	2.9	16.1	1.25	3.6	20.2	92
6	3	2775	2.9	16.1	1.36	3.9	21.9	93

LOCATION = EAST PRI GAS INLET  
FILE IDENTITY = E\_PAGI

AVERAGE VELOCITY = 2037 FPM

AVERAGE (WEIGHTED) % O2 = 3.0  
AVERAGE (WEIGHTED) % CO2 = 16.0  
AVERAGE (WEIGHTED) TEMPERATURE = 717

AVERAGE (ARITHMATIC) % O2 = 3.1  
AVERAGE (ARITHMATIC) % CO2 = 16.0  
AVERAGE (ARITHMATIC) TEMPERATURE = 716

AVERAGE STATIC PRESSURE (in. H2O) = -3.0  
AVERAGE DENSITY (LBM/FT^3) = .02898

ACFM (ACTUAL FT^3/MIN) = 330064  
LB/HR (WET) = 573934

DATE = 5/19/88  
 LOCATION = WEST PRI GAS IN  
 FILE IDENTITY = WPAGI  
 BAROMETRIC PRESSURE = 25.32  
 PROBE IDENTITY = E-1  
 PROBE COEFF A0 = 1.17088E+00  
 PROBE COEFF A1 = -4.30409E-06  
 PROBE COEFF A2 = 1.54069E-10  
 PROBE COEFF A3 = -1.65099E-15  
 PROBE COEFF A4 = 2.82564E-21  
 DUCT AREA = 162.0

NOTE: ALL CO2 VALUES ARE CALCULATED & BASED ON FUEL AND MEASURED O2

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTD % O2	WTD %CO2	WTD
1	1	2849	3.4	15.7	1.32	4.5	20.7	
1	2	2546	3.3	15.8	1.18	3.9	18.6	
1	3	2890	3.6	15.5	1.34	4.8	20.8	

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTD % O2	WTD %CO2	WTD
2	1	2621	3.5	15.6	1.22	4.3	19.0	
2	2	2619	3.1	15.9	1.22	3.8	19.4	
2	3	2624	3.5	15.6	1.22	4.3	19.0	

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTD % O2	WTD %CO2	WTD
3	1	2301	3.2	15.8	1.07	3.4	16.9	
3	2	2877	3.2	15.8	1.34	4.3	21.2	
3	3	2578	3.3	15.8	1.20	4.0	18.9	

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTD % O2	WTD %CO2	WTD
4	1	2645	3.6	15.5	1.23	4.4	19.0	
4	2	2481	3.0	16.0	1.15	3.5	18.5	
4	3	2626	3.2	15.8	1.22	3.9	19.3	

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTD % O2	WTD %CO2	WTD
5	1	1508	3.3	15.8	.70	2.3	11.0	
5	2	1199	3.3	15.8	.56	1.8	8.8	
5	3	1295	3.2	15.8	.60	1.9	9.5	

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTD % O2	WTD %CO2	WTD
6	1	973	3.0	16.0	.45	1.4	7.2	31
6	2	958	3.1	15.9	.45	1.4	7.1	31
6	3	1153	3.3	15.8	.54	1.8	8.4	36

LOCATION = WEST PRI GAS IN  
FILE IDENTITY = WPAGI

AVERAGE VELOCITY = 2152 FPM

AVERAGE (WEIGHTED) % O2 = 3.3  
AVERAGE (WEIGHTED) % CO2 = 15.7  
AVERAGE (WEIGHTED) TEMPERATURE = 706

AVERAGE (ARITHMATIC) % O2 = 3.3  
AVERAGE (ARITHMATIC) % CO2 = 15.8  
AVERAGE (ARITHMATIC) TEMPERATURE = 706

AVERAGE STATIC PRESSURE (in. H2O) = -3.0  
AVERAGE DENSITY (LBM/FT^3) = .02922

ACFM (ACTUAL FT^3/MIN) = 348685  
LB/HR (WET) = 611267

DATE = 5/19/88  
 LOCATION = EAST PRI GAS OUT  
 FILE IDENTITY = EPAGO  
 BAROMETRIC PRESSURE = 25.32  
 PROBE IDENTITY = E-11  
 PROBE COEFF A0 = 1.24866E+00  
 PROBE COEFF A1 = -1.40421E-05  
 PROBE COEFF A2 = 5.84233E-10  
 PROBE COEFF A3 = -9.17920E-15  
 PROBE COEFF A4 = 4.78536E-20  
 DUCT AREA = 90.1

NOTE: ALL CO2 VALUES ARE CALCULATED & BASED ON FUEL AND MEASURED O2

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTD % O2	WTD %CO2	WTD TEMP
1	1	2828	10.0	9.8	1.08	10.8	10.6	32
1	2	2583	5.0	14.2	.99	4.9	14.0	31
1	3	2647	5.1	14.2	1.01	5.2	14.3	31
1	4	2496	4.9	14.3	.95	4.7	13.6	31
1	5	2340	6.1	13.3	.89	5.4	11.8	31
1	6	2282	7.4	12.1	.87	6.4	10.5	31

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTD % O2	WTD %CO2	WTD TEMP
2	1	2942	10.0	9.8	1.12	11.2	11.0	32
2	2	2668	4.3	14.9	1.02	4.4	15.1	31
2	3	2479	3.5	15.6	.95	3.3	14.7	31
2	4	2429	4.0	15.1	.93	3.7	14.0	31
2	5	2287	5.2	14.1	.87	4.5	12.3	31
2	6	2237	7.2	12.3	.85	6.1	10.5	31

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTD % O2	WTD %CO2	WTD TEMP
3	1	2793	9.0	10.7	1.07	9.6	11.4	29.3
3	2	2551	5.9	13.4	.97	5.7	13.1	28.1
3	3	5050	3.8	15.3	1.93	7.3	29.5	61.0
3	4	2482	4.0	15.1	.95	3.8	14.3	32.1
3	5	1938	5.1	14.2	.74	3.8	10.5	23.4
3	6	2142	6.7	12.7	.82	5.5	10.4	25.0

LOCATION = EAST PRI GAS OUT  
FILE IDENTITY = EPAGO

AVERAGE VELOCITY = 2621 FPM

AVERAGE (WEIGHTED) % O2 = 5.9  
AVERAGE (WEIGHTED) % CO2 = 13.4  
AVERAGE (WEIGHTED) TEMPERATURE = 306

AVERAGE (ARITHMATIC) % O2 = 6.0  
AVERAGE (ARITHMATIC) % CO2 = 13.4  
AVERAGE (ARITHMATIC) TEMPERATURE = 306

AVERAGE STATIC PRESSURE (in. H2O) = -5.5  
AVERAGE DENSITY (LBM/FT^3) = .04400

ACFM (ACTUAL FT^3/MIN) = 236100  
LB/HR (WET) = 623318

DATE = 5/19/88  
 LOCATION = WEST PRI GAS OUT  
 FILE IDENTITY = WPAGO  
 BAROMETRIC PRESSURE = 25.32  
 PROBE IDENTITY = E-11  
 PROBE COEFF A0 = 1.24866E+00  
 PROBE COEFF A1 = -1.40421E-05  
 PROBE COEFF A2 = 5.84233E-10  
 PROBE COEFF A3 = -9.17920E-15  
 PROBE COEFF A4 = 4.78536E-20  
 DUCT AREA = 90.1

NOTE: ALL CO2 VALUES ARE CALCULATED & BASED ON FUEL AND MEASURED O2

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTD % O2	WTD %CO2	WTD TEMP
1	1	2615	6.0	13.4	.97	5.8	12.9	237
1	2	2401	4.2	15.0	.89	3.7	13.3	271
1	3	2453	4.8	14.4	.91	4.3	13.1	274
1	4	2349	5.6	13.7	.87	4.9	11.9	26
1	5	2279	7.1	12.4	.84	6.0	10.4	25
1	6	2293	10.3	9.5	.85	8.7	8.1	25

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTD % O2	WTD %CO2	WTD TEMP
2	1	2925	7.2	12.3	1.08	7.8	13.3	315
2	2	2675	4.6	14.6	.99	4.5	14.4	306
2	3	2475	4.0	15.1	.91	3.7	13.8	271
2	4	2357	4.5	14.7	.87	3.9	12.8	261
2	5	2596	6.9	12.5	.96	6.6	12.0	271
2	6	3574	9.7	10.1	1.32	12.8	13.3	36

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTD % O2	WTD %CO2	WTD TEMP
3	1	3015	8.7	10.9	1.11	9.7	12.2	326
3	2	2561	6.0	13.4	.95	5.7	12.6	271
3	3	2258	5.6	13.7	.83	4.7	11.4	246
3	4	3073	5.5	13.8	1.13	6.2	15.7	321
3	5	3348	7.9	11.7	1.24	9.8	14.4	341
3	6	3501	9.9	9.9	1.29	12.8	12.8	355

LOCATION = WEST PRI GAS OUT  
FILE IDENTITY = WPAGO

AVERAGE VELOCITY = 2708 FPM

AVERAGE (WEIGHTED) % O2 = 6.8

AVERAGE (WEIGHTED) % CO2 = 12.7

AVERAGE (WEIGHTED) TEMPERATURE = 290

AVERAGE (ARITHMATIC) % O2 = 6.6

AVERAGE (ARITHMATIC) % CO2 = 12.8

AVERAGE (ARITHMATIC) TEMPERATURE = 291

AVERAGE STATIC PRESSURE (in. H2O) = -5.0

AVERAGE DENSITY (LBM/FT^3) = .04487

ACFM (ACTUAL FT^3/MIN) = 243983

LB/HR (WET) = 656888

DATE = 5/25/88  
 LOCATION = BAGHOUSE INLET EAST  
 FILE IDENTITY = BAG\_EAST  
 BAROMETRIC PRESSURE = 25.42  
 PROBE IDENTITY = E-45  
 PROBE COEFF A0 = 9.51682E-01  
 PROBE COEFF A1 = 1.99376E-05  
 PROBE COEFF A2 = -9.37778E-10  
 PROBE COEFF A3 = 1.88580E-14  
 PROBE COEFF A4 = -1.36877E-19  
 DUCT AREA = 346.5

NOTE: ALL CO<sub>2</sub> VALUES ARE CALCULATED & BASED ON FUEL AND MEASURED O<sub>2</sub>

TAP	POINT	CORR V	%O <sub>2</sub>	% CO <sub>2</sub>	V LOC/AVG	WTD % O <sub>2</sub>	WTD %CO <sub>2</sub>	WTD TEMP
1	1	3548	4.4	14.8	1.16	5.1	17.1	306
1	2	3454	4.1	15.0	1.13	4.6	17.0	31
1	3	728	4.2	15.0	.24	1.0	3.6	3
1	4	4285	4.5	14.7	1.40	6.3	20.6	38
1	5	1369	4.3	14.9	.45	1.9	6.7	17
1	6	2904	4.7	14.5	.95	4.5	13.8	25
1	7	4617	4.2	15.0	1.51	6.3	22.6	426

TAP	POINT	CORR V	%O <sub>2</sub>	% CO <sub>2</sub>	V LOC/AVG	WTD % O <sub>2</sub>	WTD %CO <sub>2</sub>	WTD TEMP
2	1	3034	4.6	14				
2	2	2355	4.7	14				
2	3	1530	4.2	15				
2	4	1481	4.7	14				
2	5	1626	5.2	14				
2	6	2896	5.0	14				
2	7	4375	5.0	14				

WTD % O<sub>2</sub> = (% O<sub>2</sub>) (V Loc/Avg)  
 WTD % CO<sub>2</sub> = (% CO<sub>2</sub>) (V Loc/Avg)

TAP	POINT	CORR V	%O <sub>2</sub>	% CO <sub>2</sub>
3	1	2771	4.6	14.
3	2	2621	4.6	14.
3	3	2979	4.4	14.
3	4	3209	5.1	14.
3	5	3007	5.4	13.
3	6	2742	5.2	14.
3	7	3651	4.9	14.

TAP	POINT	CORR V	%O <sub>2</sub>	% CO <sub>2</sub>	V LOC/AVG	WTD % O <sub>2</sub>	WTD %CO <sub>2</sub>	WTD TEMP
4	1	3061	4.6	14.6	1.00	4.6	14.6	290
4	2	3003	4.8	14.4	.98	4.7	14.2	284
4	3	3565	5.1	14.2	1.17	5.9	16.5	334
4	4	3151	5.1	14.2	1.03	5.3	14.6	294
4	5	2950	5.2	14.1	.97	5.0	13.6	271
4	6	3094	5.1	14.2	1.01	5.2	14.3	289
4	7	4293	4.7	14.5	1.40	6.6	20.4	402

DATE = 5/25/88  
 LOCATION = BAGHOUSE INLET EAST  
 FILE IDENTITY = BAG\_EAST  
 BAROMETRIC PRESSURE = 25.42  
 PROBE IDENTITY = E-45  
 PROBE COEFF A0 = 9.51682E-01  
 PROBE COEFF A1 = 1.99376E-05  
 PROBE COEFF A2 = -9.37778E-10  
 PROBE COEFF A3 = 1.88580E-14  
 PROBE COEFF A4 = -1.36877E-19  
 DUCT AREA = 346.5

NOTE: ALL CO2 VALUES ARE CALCULATED & BASED ON FUEL AND MEASURED O2

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTD % O2	WTD %CO2	WTD TEMP
1	1	3548	4.4	14.8	1.16	5.1	17.1	325
1	2	3454	4.1	15.0	1.13	4.6	17.0	31
1	3	728	4.2	15.0	.24	1.0	3.6	35
1	4	4285	4.5	14.7	1.40	6.3	20.6	39
1	5	1369	4.3	14.9	.45	1.9	6.7	19
1	6	2904	4.7	14.5	.95	4.5	13.8	25
1	7	4617	4.2	15.0	1.51	6.3	22.6	425

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTD % O2	WTD %CO2	WTD TEMP
2	1	3034	4.6	14.6	.99	4.6	14.5	277
2	2	2355	4.7	14.5	.77	3.6	11.2	21
2	3	1530	4.2	15.0	.50	2.1	7.5	14
2	4	1481	4.7	14.5	.48	2.3	7.0	13
2	5	1626	5.2	14.1	.53	2.8	7.5	14
2	6	2896	5.0	14.2	.95	4.7	13.5	28
2	7	4375	5.0	14.2	1.43	7.2	20.4	41

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTD % O2	WTD %CO2	WTD TEMP
3	1	2771	4.6	14.6	.91	4.2	13.2	257
3	2	2621	4.6	14.6	.86	3.9	12.5	245
3	3	2979	4.4	14.8	.97	4.3	14.4	273
3	4	3209	5.1	14.2	1.05	5.4	14.9	296
3	5	3007	5.4	13.9	.98	5.3	13.7	277
3	6	2742	5.2	14.1	.90	4.7	12.6	256
3	7	3651	4.9	14.3	1.19	5.9	17.1	340

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTD % O2	WTD %CO2	WTD TEMP
4	1	3061	4.6	14.6	1.00	4.6	14.6	290
4	2	3003	4.8	14.4	.98	4.7	14.2	284
4	3	3565	5.1	14.2	1.17	5.9	16.5	334
4	4	3151	5.1	14.2	1.03	5.3	14.6	294
4	5	2950	5.2	14.1	.97	5.0	13.6	271
4	6	3094	5.1	14.2	1.01	5.2	14.3	289
4	7	4293	4.7	14.5	1.40	6.6	20.4	402

TAP	POINT	CORR	V	%02	% CO2	V	LOC/AVG	WTD	%02	WTD %CO2	WTD	TEMP
5	1	3194	4.5	14.7	14.7	1.05		4.7	15.3	28.3		
5	2	2846	4.8	14.4	14.4	.93		4.5	13.4	27.6		
5	3	2793	5.2	14.1	14.1	.91		4.8	12.9	27.3		
5	4	3110	5.2	14.1	14.1	1.02		5.3	14.3	29.3		
5	5	3402	5.1	14.2	14.2	1.11		5.7	15.8	32.1		
5	6	3315	4.9	14.3	14.3	1.08		5.3	15.5	31.2		
5	7	3387	4.6	14.6	14.6	1.11		5.1	16.2	31.6		

TAP	POINT	CORR	V	%02	% CO2	V	LOC/AVG	WTD	%02	WTD %CO2	WTD	TEMP
6	1	2622	4.4	14.8	14.8	.86		3.8	12.7	24.6		
6	2	2461	4.6	14.6	14.6	.81		3.7	11.8	23.4		
6	3	2843	5.1	14.2	14.2	.93		4.7	13.2	26.1		
6	4	2932	5.3	14.0	14.0	.96		5.1	13.4	27.1		
6	5	3089	5.2	14.1	14.1	1.01		5.3	14.2	26.1		
6	6	3168	5.0	14.2	14.2	1.04		5.2	14.8	26.1		
6	7	3433	4.9	14.3	14.3	1.12		5.5	16.1	32.1		

TAP	POINT	CORR	V	%02	% CO2	V	LOC/AVG	WTD	%02	WTD %CO2	WTD	TEMP
7	1	2722	4.4	14.8	14.8	.89		3.9	13.2	25		
7	2	2392	4.5	14.7	14.7	.78		3.5	11.5	22		
7	3	2584	4.6	14.6	14.6	.85		3.9	12.3	24		
7	4	2817	5.1	14.2	14.2	.92		4.7	13.0	27		
7	5	3208	5.2	14.1	14.1	1.05		5.5	14.8	30		
7	6	3261	5.2	14.1	14.1	1.07		5.5	15.0	30		
7	7	3234	5.2	14.1	14.1	1.06		5.5	14.9	30		

TAP	POINT	CORR	V	%02	% CO2	V	LOC/AVG	WTD	%02	WTD %CO2	WTD	TEMP
8	1	3077	4.5	14.7	14.7	1.01		4.5	14.8	26.1		
8	2	3116	4.7	14.5	14.5	1.02		4.8	14.8	26.1		
8	3	3566	4.9	14.3	14.3	1.17		5.7	16.7	34.0		
8	4	3844	5.1	14.2	14.2	1.26		6.4	17.8	36		
8	5	4051	5.3	14.0	14.0	1.33		7.0	18.5	36.4		
8	6	3979	5.5	13.8	13.8	1.30		7.2	18.0	37		
8	7	4416	5.3	14.0	14.0	1.44		7.7	20.2	41.6		

LOCATION = BAGHOUSE INLET EAST  
FILE IDENTITY = BAG\_EAST

AVERAGE VELOCITY = 3056 FPM

AVERAGE (WEIGHTED) % O2 = 4.9

AVERAGE (WEIGHTED) % CO2 = 14.4

AVERAGE (WEIGHTED) TEMPERATURE = 286

AVERAGE (ARITHMATIC) % O2 = 4.8

AVERAGE (ARITHMATIC) % CO2 = 14.4

AVERAGE (ARITHMATIC) TEMPERATURE = 286

AVERAGE STATIC PRESSURE (in. H2O) = -6.0

AVERAGE DENSITY (LBM/FT^3) = .04533

ACFM (ACTUAL FT^3/MIN) = 1059060

LB/HR (WET) = 2880603

DATE = 5/24/88  
 LOCATION = BAG INLET CENTER  
 FILE IDENTITY = BAG\_CENTER  
 BAROMETRIC PRESSURE = 25.36  
 PROBE IDENTITY = E-45  
 PROBE COEFF A0 = 9.51682E-01  
 PROBE COEFF A1 = 1.99376E-05  
 PROBE COEFF A2 = -9.37778E-10  
 PROBE COEFF A3 = 1.88580E-14  
 PROBE COEFF A4 = -1.36877E-19  
 DUCT AREA = 346.5

NOTE: ALL CO2 VALUES ARE CALCULATED & BASED ON FUEL AND MEASURED O2

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTD % O2	WTD %CO2	WTD TEMP
1	1	3775	4.7	14.5	1.31	6.2	19.0	400
1	2	1237	4.6	14.6	.43	2.0	6.3	131
1	3	1440	4.3	14.9	.50	2.2	7.4	155
1	4	2549	4.6	14.6	.89	4.1	12.9	277
1	5	749	4.3	14.9	.26	1.1	3.9	61
1	6	1238	4.2	15.0	.43	1.8	6.4	137
1	7	3371	4.3	14.9	1.17	5.0	17.4	361

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTD % O2	WTD %CO2	WTD TEMP
2	1	1208	4.6	14.6	.42	1.9	6.1	131
2	2	1117	4.5	14.7	.39	1.7	5.7	113
2	3	2977	4.4	14.8	1.04	4.6	15.3	321
2	4	2944	4.3	14.9	1.02	4.4	15.2	322
2	5	3367	4.4	14.8	1.17	5.2	17.3	366
2	6	2263	4.4	14.8	.79	3.5	11.6	245
2	7	1427	4.4	14.8	.50	2.2	7.3	154

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTD % O2	WTD %CO2	WTD TEMP
3	1	2776	4.6	14.6	.97	4.4	14.1	294
3	2	3166	4.4	14.8	1.10	4.8	16.3	336
3	3	3888	4.3	14.9	1.35	5.8	20.1	414
3	4	3802	4.3	14.9	1.32	5.7	19.6	411
3	5	3918	4.3	14.9	1.36	5.9	20.2	426
3	6	4038	4.4	14.8	1.40	6.2	20.7	437
3	7	3202	4.4	14.8	1.11	4.9	16.4	343

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTD % O2	WTD %CO2	WTD TEMP
4	1	2754	4.5	14.7	.96	4.3	14.1	289
4	2	3417	4.2	15.0	1.19	5.0	17.8	362
4	3	4227	4.2	15.0	1.47	6.2	22.0	450
4	4	4096	4.1	15.0	1.42	5.8	21.4	436
4	5	4012	4.2	15.0	1.39	5.9	20.9	431
4	6	3979	4.1	15.0	1.38	5.7	20.8	432
4	7	3915	4.0	15.1	1.36	5.4	20.6	423

TAP	POINT	CORR	V	%O2	% CO2	V	LOC/AVG	WTD	% O2	WTD	%CO2	WTD	TE
5	1	2904	4.0	15.1	15.1	1.01		4.0	15.3		328		
5	2	3548	4.1	15.0	15.0	1.23		5.1	18.6		378		
5	3	4361	4.1	15.0	15.0	1.52		6.2	22.8		464		
5	4	4112	4.0	15.1	15.1	1.43		5.7	21.6		442		
5	5	4014	4.1	15.0	15.0	1.40		5.7	21.0		431		
5	6	4002	4.0	15.1	15.1	1.39		5.6	21.1		431		
5	7	3765	4.0	15.1	15.1	1.31		5.2	19.8		40		

TAP	POINT	CORR	V	%O2	% CO2	V	LOC/AVG	WTD	% O2	WTD	%CO2	WTD	TE
6	1	2642	4.2	15.0	15.0	.92		3.9	13.7		23		
6	2	3688	4.1	15.0	15.0	1.28		5.3	19.3		33		
6	3	3708	4.0	15.1	15.1	1.29		5.2	19.5		43		
6	4	3698	4.0	15.1	15.1	1.29		5.1	19.5		43		
6	5	3819	4.0	15.1	15.1	1.33		5.3	20.1		41		
6	6	3545	4.1	15.0	15.0	1.23		5.1	18.5		31		
6	7	2983	4.1	15.0	15.0	1.04		4.3	15.6		31		

TAP	POINT	CORR	V	%O2	% CO2	V	LOC/AVG	WTD	% O2	WTD	%CO2	WTD	TE
7	1	1152	4.3	14.9	14.9	.40		1.7	6.0		11		
7	2	677	4.1	15.0	15.0	.24		1.0	3.5		11		
7	3	2843	4.0	15.1	15.1	.99		4.0	15.0		11		
7	4	2037	3.9	15.2	15.2	.71		2.8	10.8		11		
7	5	2392	4.0	15.1	15.1	.83		3.3	12.6		11		
7	6	2064	4.1	15.0	15.0	.72		2.9	10.8		11		
7	7	1684	4.0	15.1	15.1	.59		2.3	8.9		11		

TAP	POINT	CORR	V	%O2	% CO2	V	LOC/AVG	WTD	% O2	WTD	%CO2	WTD	TE
8	1	4025	4.0	15.1	15.1	1.40		5.6	21.2		2		
8	2	2098	4.1	15.0	15.0	.73		3.0	11.0		2		
8	3	1578	4.0	15.1	15.1	.55		2.2	8.3		2		
8	4	3856	3.9	15.2	15.2	1.34		5.2	20.4		4		
8	5	703	4.0	15.1	15.1	.24		1.0	3.7		2		
8	6	1586	4.0	15.1	15.1	.55		2.2	8.3		2		
8	7	2730	4.0	15.1	15.1	.95		3.8	14.4		2		

LOCATION = BAG INLET CENTER  
FILE IDENTITY = BAG\_CENTER

AVERAGE VELOCITY = 2876 FPM

AVERAGE (WEIGHTED) % O2 = 4.2  
AVERAGE (WEIGHTED) % CO2 = 15.0  
AVERAGE (WEIGHTED) TEMPERATURE = 311

AVERAGE (ARITHMATIC) % O2 = 4.2  
AVERAGE (ARITHMATIC) % CO2 = 15.0  
AVERAGE (ARITHMATIC) TEMPERATURE = 311

AVERAGE STATIC PRESSURE (in. H2O) = -6.0  
AVERAGE DENSITY (LBM/FT^3) = .04382

ACFM (ACTUAL FT^3/MIN) = 996602  
LB/HR (WET) = 2620044

DATE = 5/23/88  
 LOCATION = BAGHOUSE INLET WEST  
 FILE IDENTITY = BAG\_WEST  
 BAROMETRIC PRESSURE = 25.36  
 PROBE IDENTITY = E-45  
 PROBE COEFF A0 = 9.51682E-01  
 PROBE COEFF A1 = 1.99376E-05  
 PROBE COEFF A2 = -9.37778E-10  
 PROBE COEFF A3 = 1.88580E-14  
 PROBE COEFF A4 = -1.36877E-19  
 DUCT AREA = 346.5

NOTE: ALL CO2 VALUES ARE CALCULATED & BASED ON FUEL AND MEASURED O2

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTG % O2	WTG %CO2	WTG TEMP
1	1	2543	5.1	14.2	.85	4.3	12.0	244
1	2	3006	5.4	13.9	1.00	5.4	13.9	257
1	3	3289	5.5	13.8	1.09	6.0	15.1	315
1	4	3567	5.7	13.6	1.19	6.8	16.2	343
1	5	4237	6.2	13.2	1.41	8.7	18.6	333
1	6	5089	6.6	12.8	1.69	11.2	21.7	477
1	7	6675	6.8	12.6	2.22	15.1	28.1	624

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTG % O2	WTG %CO2	WTG TEMP
2	1	2409	5.2	14.1	.80	4.2	11.3	235
2	2	2008	5.3	14.0	.67	3.5	9.3	197
2	3	2546	5.6	13.7	.85	4.7	11.6	255
2	4	2622	5.9	13.4	.87	5.1	11.7	255
2	5	2872	6.2	13.2	.96	5.9	12.6	277
2	6	3851	6.5	12.9	1.28	8.3	16.5	37
2	7	2882	6.5	12.9	.96	6.2	12.4	277

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTG % O2	WTG %CO2	WTG TEMP
3	1	1970	5.1	14.2	.66	3.3	9.3	135
3	2	2088	5.2	14.1	.69	3.6	9.8	205
3	3	2378	5.4	13.9	.79	4.3	11.0	227
3	4	2492	5.7	13.6	.83	4.7	11.3	244
3	5	2970	6.1	13.3	.99	6.0	13.1	280
3	6	2872	6.2	13.2	.96	5.9	12.6	277
3	7	3467	5.9	13.4	1.15	6.8	15.5	334

TAP	POINT	CORR V	%O2	% CO2	V LOC/AVG	WTG % O2	WTG %CO2	WTG TEMP
4	1	2808	5.0	14.2	.93	4.7	13.3	285
4	2	3114	5.1	14.2	1.04	5.3	14.7	317
4	3	2824	5.0	14.2	.94	4.7	13.4	280
4	4	2913	5.5	13.8	.97	5.3	13.4	291
4	5	3279	5.9	13.4	1.09	6.4	14.7	323
4	6	4056	6.1	13.3	1.35	8.2	17.9	401
4	7	3728	5.7	13.6	1.24	7.1	16.9	365

TAP	POINT	CORR	V	%CO2	% CO2	V	LOC/AVG	WTD	% CO2	WTD %CO2	WTD	TE
5	1	3103	4.9	14.3	14.3	1.03		5.1	14.8	3.8		
5	2	2384	5.1	14.2	14.2	.79		4.0	11.2	243		
5	3	3265	5.2	14.1	14.1	1.09		5.6	15.3	343		
5	4	3341	5.5	13.8	13.8	1.11		6.1	15.3	330		
5	5	2753	5.8	13.5	13.5	.92		5.3	12.4	272		
5	6	2949	5.9	13.4	13.4	.98		5.8	13.2	289		
5	7	3400	5.7	13.6	13.6	1.13		6.4	15.4	274		

TAP	POINT	CORR	V	%CO2	% CO2	V	LOC/AVG	WTD	% CO2	WTD %CO2	WTD	TE
6	1	2742	4.9	14.3	14.3	.91		4.5	13.1	211		
6	2	2338	4.7	14.5	14.5	.78		3.7	11.3	231		
6	3	2802	5.0	14.2	14.2	.93		4.7	13.3	229		
6	4	3712	5.3	14.0	14.0	1.23		6.5	17.3	254		
6	5	3565	5.8	13.5	13.5	1.19		6.9	16.0	260		
6	6	2932	5.7	13.6	13.6	.98		5.6	13.3	211		
6	7	3937	5.7	13.6	13.6	1.31		7.5	17.8	222		

TAP	POINT	CORR	V	%CO2	% CO2	V	LOC/AVG	WTD	% CO2	WTD %CO2	WTD	TE
7	1	2421	4.9	14.3	14.3	.81		3.9	11.5	211		
7	2	2342	4.8	14.4	14.4	.78		3.7	11.2	211		
7	3	2046	4.8	14.4	14.4	.68		3.3	9.8	210		
7	4	980	5.3	14.0	14.0	.33		1.7	4.6	111		
7	5	973	5.6	13.7	13.7	.32		1.8	4.4	111		
7	6	2034	5.9	13.4	13.4	.68		4.0	9.1	111		
7	7	3685	5.7	13.6	13.6	1.23		7.0	16.7	231		

TAP	POINT	CORR	V	%CO2	% CO2	V	LOC/AVG	WTD	% CO2	WTD %CO2	WTD	TE
8	1	3493	4.8	14.4	14.4	1.16		5.6	16.7	2		
8	2	4020	4.9	14.3	14.3	1.34		6.6	19.2	40		
8	3	1667	5.1	14.2	14.2	.55		2.8	7.8	11		
8	4	4617	5.2	14.1	14.1	1.54		8.0	21.6	452		
8	5	1604	5.4	13.9	13.9	.53		2.9	7.4	1		
8	6	2644	5.5	13.8	13.8	.88		4.8	12.1	1		
8	7	4066	5.5	13.8	13.8	1.35		7.4	18.7	2		

LOCATION = BAGHOUSE INLET WEST  
FILE IDENTITY = BAG\_WEST

AVERAGE VELOCITY = 3007 FPM

AVERAGE (WEIGHTED) % O2 = 5.6

AVERAGE (WEIGHTED) % CO2 = 13.7

AVERAGE (WEIGHTED) TEMPERATURE = 295

AVERAGE (ARITHMATIC) % O2 = 5.5

AVERAGE (ARITHMATIC) % CO2 = 13.8

AVERAGE (ARITHMATIC) TEMPERATURE = 295

AVERAGE STATIC PRESSURE (in. H2O) = -6.0

AVERAGE DENSITY (LBM/FT^3) = .04465

ACFM (ACTUAL FT^3/MIN) = 1041779

LB/HR (WET) = 2790753

APPENDIX B

IP14\_000715

DATE = 5/21/88  
 LOCATION = EAST ECON OUTLET  
 FILE IDENTITY = EAST\_ECON  
 BAROMETRIC PRESSURE = 25.48  
 PROBE IDENTITY = E-8  
 DUCT HEIGHT = 21.2  
 DUCT WIDTH = 40.0

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
1	1	-2.0	690	.119	20	4.1	15.0
1	2	-2.0	683	.358	20	3.9	15.2
1	3	-2.0	697	.297	15	4.2	15.0
1	4	-2.0	716	.227	25	4.8	14.4
1	5	-2.0	731	.244	20	5.2	14.1
1	6	-2.0	733	.192	5	5.3	14.0
1	7	-2.0	731	.163	0	5.4	13.9

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
2	1	-2.0	709	.061	15	4.0	15.1
2	2	-2.0	703	.336	0	3.6	15.5
2	3	-2.0	711	.275	10	3.9	15.2
2	4	-2.0	722	.212	15	4.7	14.5
2	5	-2.0	734	.209	20	4.9	14.3
2	6	-2.0	734	.209	10	5.2	14.1
2	7	-2.0	733	.192	10	5.2	14.1

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
3	1	-2.0	711	.039	0	4.3	14.9
3	2	-2.0	707	.280	10	4.1	15.0
3	3	-2.0	709	.295	10	3.7	15.4
3	4	-2.0	717	.266	0	4.2	15.0
3	5	-2.0	721	.207	5	4.6	14.6
3	6	-2.0	725	.214	5	4.9	14.3
3	7	-2.0	733	.148	5	5.0	14.2

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
4	1	-2.0	708	.021	0	4.0	15.1
4	2	-2.0	713	.112	10	4.1	15.0
4	3	-2.0	700	.271	5	4.1	15.0
4	4	-2.0	711	.227	0	4.0	15.1
4	5	-2.0	723	.214	0	4.4	14.8
4	6	-2.0	732	.212	0	4.5	14.7
4	7	-2.0	737	.117	5	4.9	14.3

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%02	% CO2
5	1	-2.0	700	.036	5	4.2	15.0
5	2	-2.0	719	.041	15	3.8	15.3
5	3	-2.0	698	.256	15	3.7	15.4
5	4	-2.0	714	.190	5	4.2	15.0
5	5	-2.0	731	.234	10	4.6	14.6
5	6	-2.0	745	.229	10	5.1	14.2
5	7	-2.0	744	.139	10	5.7	13.6

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%02	% CO2
6	1	-2.0	714	.036	0	3.9	15.2
6	2	-2.0	727	.014	20	4.2	15.0
6	3	-2.0	710	.300	5	3.9	15.2
6	4	-2.0	720	.283	5	4.1	15.0
6	5	-2.0	735	.197	5	4.5	14.7
6	6	-2.0	751	.207	10	5.3	14.0
6	7	-2.0	744	.131	15	5.7	13.6

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%02	% CO2
7	1	-2.0	683	.036	10	4.7	14.5
7	2	-2.0	710	.036	0	4.2	15.0
7	3	-2.0	716	.314	0	3.7	15.4
7	4	-2.0	727	.263	10	3.9	15.2
7	5	-2.0	743	.224	15	4.4	14.8
7	6	-2.0	762	.151	5	4.7	14.5
7	7	-2.0	752	.104	5	5.2	14.1

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%02	% CO2
8	1	-2.0	698	.043	0	3.7	15.4
8	2	-2.0	709	.046	0	3.6	15.5
8	3	-2.0	712	.300	20	3.9	15.2
8	4	-2.0	729	.161	10	3.7	15.4
8	5	-2.0	755	.156	15	4.4	14.8
8	6	-2.0	761	.158	10	4.9	14.3
8	7	-2.0	752	.075	5	5.2	14.1

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%02	% CO2
9	1	-2.0	707	.046	0	3.7	15.4
9	2	-2.0	713	.017	0	3.7	15.4
9	3	-2.0	715	.305	20	3.4	15.7
9	4	-2.0	733	.219	10	3.5	15.6
9	5	-2.0	754	.188	10	3.8	15.3
9	6	-2.0	753	.112	5	4.8	14.4
9	7	-2.0	746	.012	5	5.5	13.8

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%02	% CO2
10	1	-2.0	710	.043	0	3.8	15.3
10	2	-2.0	718	.037	0	3.6	15.5
10	3	-2.0	721	.288	5	3.6	15.5
10	4	-2.0	735	.241	0	3.3	15.8
10	5	-2.0	750	.205	15	3.5	15.6
10	6	-2.0	751	.112	0	4.1	15.0
10	7	-2.0	744	.029	5	4.9	14.3

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%02	% CO2
11	1	-2.0	705	.053	0	4.0	15.1
11	2	-2.0	719	.017	0	3.8	15.3
11	3	-2.0	722	.275	10	3.5	15.6
11	4	-2.0	731	.231	5	3.4	15.7
11	5	-2.0	748	.197	15	3.5	15.6
11	6	-2.0	746	.209	10	4.0	15.1
11	7	-2.0	743	.080	15	4.7	14.5

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%02	% CO2
12	1	-2.0	715	.048	0	3.9	15.2
12	2	-2.0	722	.031	10	3.9	15.2
12	3	-2.0	715	.283	5	3.9	15.2
12	4	-2.0	718	.224	0	3.6	15.5
12	5	-2.0	744	.241	5	3.5	15.6
12	6	-2.0	741	.236	5	3.7	15.4
12	7	-2.0	740	.144	5	4.0	15.1

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%02	% CO2
13	1	-2.0	680	.039	0	4.1	15.0
13	2	-2.0	710	.039	0	3.4	15.7
13	3	-2.0	727	.043	15	3.5	15.6
13	4	-2.0	706	.275	10	3.2	15.8
13	5	-2.0	725	.253	10	3.3	15.8
13	6	-2.0	742	.273	15	4.4	14.8
13	7	-2.0	732	.241	5	4.7	14.5

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%02	% CO2
14	1	-2.0	688	.034	0	3.2	15.8
14	2	-2.0	695	.034	0	3.7	15.4
14	3	-2.0	703	.024	15	3.3	15.8
14	4	-2.0	700	.297	15	3.4	15.7
14	5	-2.0	720	.292	15	3.3	15.8
14	6	-2.0	747	.266	10	3.7	15.4
14	7	-2.0	734	.048	5	4.1	15.0

DATE = 5/20/88  
 LOCATION = ECCON OUTLET WEST  
 FILE IDENTITY = WECON  
 BAROMETRIC PRESSURE = 25.46  
 PROBE IDENTITY = E-8  
 DUCT HEIGHT = 21.2  
 DUCT WIDTH = 40.0

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
1	1	-2.0	645	.017	0	3.8	15.3
1	2	-2.0	651	.009	0	3.8	15.3
1	3	-2.0	690	.098	15	3.3	15.8
1	4	-2.0	710	.349	15	3.2	15.8
1	5	-2.0	731	.324	25	4.0	15.1
1	6	-2.0	739	.258	30	3.6	15.5
1	7	-2.0	746	.156	30	4.0	15.1
TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
2	1	-2.0	680	.007	0	4.5	14.7
2	2	-2.0	693	.007	0	3.5	15.6
2	3	-2.0	710	.034	10	3.1	15.9
2	4	-2.0	699	.280	10	2.8	16.2
2	5	-2.0	717	.268	20	3.3	15.8
2	6	-2.0	733	.261	30	3.8	15.3
2	7	-2.0	745	.217	25	4.1	15.0
TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
3	1	-2.0	717	.009	15	3.8	15.3
3	2	-2.0	720	.004	5	3.4	15.7
3	3	-2.0	711	.278	10	3.3	15.8
3	4	-2.0	711	.249	10	3.4	15.7
3	5	-2.0	727	.166	20	4.0	15.1
3	6	-2.0	750	.205	30	4.5	14.7
3	7	-2.0	751	.217	5	4.8	14.4
TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
4	1	-2.0	718	.003	5	4.0	15.1
4	2	-2.0	723	.034	5	4.2	15.0
4	3	-2.0	719	.346	0	3.9	15.2
4	4	-2.0	726	.310	15	4.2	15.0
4	5	-2.0	741	.217	30	4.8	14.4
4	6	-2.0	749	.197	30	4.8	14.4
4	7	-2.0	747	.173	0	4.5	14.7

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%02	% CO2
5	1	-2.0	715	.009	10	4.0	15.1
5	2	-2.0	718	.038	0	4.1	15.0
5	3	-2.0	715	.320	5	3.9	15.2
5	4	-2.0	727	.258	10	4.4	14.8
5	5	-2.0	732	.244	15	4.8	14.4
5	6	-2.0	729	.139	15	3.9	15.2
5	7	-2.0	729	.092	10	4.1	15.0

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%02	% CO2
6	1	-2.0	716	.017	0	4.1	15.0
6	2	-2.0	713	.029	0	3.8	15.3
6	3	-2.0	713	.266	0	4.0	15.1
6	4	-2.0	732	.188	10	4.2	15.0
6	5	-2.0	744	.214	10	4.5	14.7
6	6	-2.0	742	.109	20	5.1	14.2
6	7	-2.0	741	.070	15	4.9	14.3

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%02	% CO2
7	1	-2.0	718	.014	0	4.1	15.0
7	2	-2.0	718	.012	0	4.2	15.0
7	3	-2.0	720	.349	10	3.8	15.3
7	4	-2.0	741	.185	5	4.1	15.0
7	5	-2.0	753	.200	5	5.0	14.2
7	6	-2.0	755	.173	20	4.7	14.5
7	7	-2.0	750	.141	20	5.2	14.1

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%02	% CO2
8	1	-2.0	713	.012	0	4.0	15.1
8	2	-2.0	723	.151	5	4.0	15.1
8	3	-2.0	709	.356	10	3.7	15.4
8	4	-2.0	735	.292	5	4.2	15.0
8	5	-2.0	752	.224	5	4.6	14.6
8	6	-2.0	758	.222	15	5.0	14.2
8	7	-2.0	753	.209	30	5.4	13.9

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%02	% CO2
9	1	-2.0	714	.019	0	3.7	15.4
9	2	-2.0	718	.078	10	3.9	15.2
9	3	-2.0	706	.273	5	4.1	15.0
9	4	-2.0	724	.202	5	4.1	15.0
9	5	-2.0	737	.205	10	4.9	14.3
9	6	-2.0	746	.219	10	5.0	14.2
9	7	-2.0	751	.168	5	5.2	14.1

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
10	1	-2.0	713	.019	0	3.7	15.4
10	2	-2.0	714	.102	0	3.9	15.2
10	3	-2.0	709	.271	5	3.6	15.5
10	4	-2.0	720	.249	10	3.9	15.2
10	5	-2.0	726	.195	15	4.4	14.8
10	6	-2.0	734	.244	20	5.1	14.2
10	7	-2.0	743	.185	0	4.9	14.3

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
11	1	-2.0	709	.026	0	3.5	15.6
11	2	-2.0	710	.297	20	3.4	15.7
11	3	-2.0	711	.290	15	3.6	15.5
11	4	-2.0	723	.319	10	4.2	15.0
11	5	-2.0	731	.295	20	4.8	14.4
11	6	-2.0	741	.241	20	5.3	14.0
11	7	-2.0	745	.131	15	5.6	13.7

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
12	1	-2.0	680	.031	0	5.5	13.8
12	2	-2.0	708	.354	30	3.8	15.3
12	3	-2.0	708	.314	15	4.1	15.0
12	4	-2.0	720	.239	20	4.3	14.9
12	5	-2.0	732	.273	20	4.9	14.3
12	6	-2.0	743	.246	15	5.8	13.7
12	7	-2.0	744	.158	20	5.9	13.4

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
13	1	-2.0	709	.073	20	3.8	15.3
13	2	-2.0	703	.351	20	3.3	15.8
13	3	-2.0	707	.317	20	3.5	15.6
13	4	-2.0	722	.361	15	4.4	14.8
13	5	-2.0	737	.295	15	5.4	13.9
13	6	-2.0	738	.424	20	6.2	13.2
13	7	-2.0	753	.427	10	6.5	12.9

DATE = 5/19/88  
 LOCATION = EAST PRI GAS INLET  
 FILE IDENTITY = E\_PAGI  
 BAROMETRIC PRESSURE = 25.32  
 PROBE IDENTITY = E-1  
 DUCT HEIGHT = 9.0  
 DUCT WIDTH = 18.0

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
1	1	-3.0	712	.002	0	3.1	15.9
1	2	-3.0	715	.004	0	3.0	16.0
1	3	-3.0	709	.026	0	2.9	16.1
TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
2	1	-3.0	705	.031	0	3.2	15.8
2	2	-3.0	713	.017	0	3.5	15.6
2	3	-3.0	709	.092	0	3.0	16.0
TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
3	1	-3.0	712	.136	5	3.2	15.8
3	2	-3.0	714	.100	0	3.0	16.0
3	3	-3.0	715	.087	0	3.1	15.9
TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
4	1	-3.0	713	.078	0	3.0	16.0
4	2	-3.0	718	.156	15	2.9	16.1
4	3	-3.0	721	.100	0	3.0	16.0
TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
5	1	-3.0	718	.097	10	3.0	16.0
5	2	-3.0	723	.151	15	2.9	16.1
5	3	-3.0	722	.129	5	3.1	15.9
TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
6	1	-3.0	722	.117	10	3.4	15.7
6	2	-3.0	722	.117	0	2.9	16.1
6	3	-3.0	722	.139	0	2.9	16.1

DATE = 5/19/88  
 LOCATION = WEST PRI GAS IN  
 FILE IDENTITY = WPAGI  
 BAROMETRIC PRESSURE = 25.32  
 PROBE IDENTITY = E-1  
 DUCT HEIGHT = 9.0  
 DUCT WIDTH = 18.0

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
1	1	-3.0	688	.151	0	3.4	15.7
1	2	-3.0	700	.119	0	3.3	15.8
1	3	-3.0	705	.153	0	3.6	15.5
TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
2	1	-3.0	709	.129	10	3.5	15.6
2	2	-3.0	710	.134	15	3.1	15.9
2	3	-3.0	712	.126	5	3.5	15.6
TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
3	1	-3.0	699	.097	0	3.2	15.8
3	2	-3.0	704	.153	5	3.2	15.8
3	3	-3.0	709	.122	5	3.3	15.8
TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
4	1	-3.0	704	.129	5	3.6	15.5
4	2	-3.0	709	.112	0	3.0	16.0
4	3	-3.0	714	.126	5	3.2	15.8
TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
5	1	-3.0	707	.041	0	3.3	15.8
5	2	-3.0	708	.026	5	3.3	15.8
5	3	-3.0	711	.031	10	3.2	15.8
TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
6	1	-3.0	704	.017	0	3.0	16.0
6	2	-3.0	704	.017	10	3.1	15.9
6	3	-3.0	710	.024	5	3.3	15.8

DATE = 5/19/88  
 LOCATION = EAST PRI GAS OUT  
 FILE IDENTITY = EPAGO  
 BAROMETRIC PRESSURE = 25.32  
 PROBE IDENTITY = E-11  
 DUCT HEIGHT = 10.5  
 DUCT WIDTH = 8.6

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
1	1	-5.5	256	.236	0	10.0	9.8
1	2	-5.5	301	.185	0	5.0	14.2
1	3	-5.5	310	.192	0	5.1	14.2
1	4	-5.5	318	.168	0	4.9	14.3
1	5	-5.5	318	.151	10	6.1	13.3
1	6	-5.5	311	.141	5	7.4	12.1

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
2	1	-5.5	274	.249	0	10.0	9.8
2	2	-5.5	312	.195	0	4.3	14.9
2	3	-5.5	319	.166	0	3.5	15.6
2	4	-5.5	323	.158	0	4.0	15.1
2	5	-5.5	318	.141	5	5.2	14.1
2	6	-5.5	307	.136	5	7.2	12.3

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
3	1	-5.5	281	.222	0	9.0	10.7
3	2	-5.5	300	.180	0	5.9	13.4
3	3	-5.5	317	.713	0	3.8	15.3
3	4	-5.5	319	.166	0	4.0	15.1
3	5	-5.5	317	.100	5	5.1	14.2
3	6	-5.5	309	.124	5	6.7	12.7

DATE = 5/19/88  
 LOCATION = WEST PRI GAS OUT  
 FILE IDENTITY = WPAGO  
 BAROMETRIC PRESSURE = 25.32  
 PROBE IDENTITY = E-11  
 DUCT HEIGHT = 10.5  
 DUCT WIDTH = 8.6

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
1	1	-5.0	292	.192	0	6.0	13.4
1	2	-5.0	307	.158	0	4.2	15.0
1	3	-5.0	303	.166	0	4.8	14.4
1	4	-5.0	296	.153	0	5.6	13.7
1	5	-5.0	283	.146	0	7.1	12.4
1	6	-5.0	276	.148	0	10.3	9.5
TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
2	1	-5.0	294	.241	0	7.2	12.3
2	2	-5.0	309	.197	0	4.6	14.6
2	3	-5.0	309	.168	0	4.0	15.1
2	4	-5.0	302	.158	10	4.5	14.7
2	5	-5.0	288	.190	0	6.9	12.5
2	6	-5.0	274	.373	0	9.7	10.1
TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
3	1	-5.0	275	.263	0	8.7	10.9
3	2	-5.0	293	.185	5	6.0	13.4
3	3	-5.0	295	.141	0	5.6	13.7
3	4	-5.0	294	.268	0	5.5	13.8
3	5	-5.0	280	.327	5	7.9	11.7
3	6	-5.0	275	.368	10	9.9	9.9

DATE = 5/25/88  
 LOCATION = BAGHOUSE INLET EAST  
 FILE IDENTITY = BAG\_EAST  
 BAROMETRIC PRESSURE = 25.42  
 PROBE IDENTITY = E-45  
 DUCT HEIGHT = 18.0  
 DUCT WIDTH = 19.3

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
1	1	-6.0	280	.422	15	4.4	14.8
1	2	-6.0	281	.400	15	4.1	15.0
1	3	-6.0	282	.021	15	4.2	15.0
1	4	-6.0	282	.610	15	4.5	14.7
1	5	-6.0	280	.073	20	4.3	14.9
1	6	-6.0	280	.302	20	4.7	14.5
1	7	-6.0	282	.681	10	4.2	15.0

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
2	1	-6.0	279	.329	20	4.6	14.6
2	2	-6.0	281	.192	15	4.7	14.5
2	3	-6.0	284	.085	15	4.2	15.0
2	4	-6.0	285	.080	15	4.7	14.5
2	5	-6.0	278	.096	15	5.2	14.1
2	6	-6.0	280	.285	15	5.0	14.2
2	7	-6.0	284	.610	10	5.0	14.2

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
3	1	-6.0	283	.261	15	4.6	14.6
3	2	-6.0	286	.219	0	4.6	14.6
3	3	-6.0	285	.280	0	4.4	14.8
3	4	-6.0	282	.324	0	5.1	14.2
3	5	-6.0	282	.286	0	5.4	13.9
3	6	-6.0	285	.246	10	5.2	14.1
3	7	-6.0	285	.427	10	4.9	14.3

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
4	1	-6.0	290	.302	10	4.6	14.6
4	2	-6.0	289	.285	5	4.8	14.4
4	3	-6.0	286	.407	10	5.1	14.2
4	4	-6.0	285	.314	5	5.1	14.2
4	5	-6.0	281	.295	15	5.2	14.1
4	6	-6.0	285	.310	10	5.1	14.2
4	7	-6.0	286	.573	5	4.7	14.5

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
5	1	-6.0	286	.322	5	4.5	14.7
5	2	-6.0	296	.261	10	4.8	14.4
5	3	-6.0	299	.251	10	5.2	14.1
5	4	-6.0	288	.312	10	5.2	14.1
5	5	-6.0	288	.371	10	5.1	14.2
5	6	-6.0	288	.345	5	4.9	14.3
5	7	-6.0	285	.361	5	4.6	14.6

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
6	1	-6.0	287	.219	0	4.4	14.8
6	2	-6.0	290	.195	5	4.6	14.6
6	3	-6.0	287	.263	10	5.1	14.2
6	4	-6.0	290	.278	10	5.3	14.0
6	5	-6.0	286	.302	5	5.2	14.1
6	6	-6.0	286	.317	5	5.0	14.2
6	7	-6.0	289	.366	0	4.9	14.3

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
7	1	-6.0	290	.236	5	4.4	14.8
7	2	-6.0	292	.183	0	4.5	14.7
7	3	-6.0	291	.212	0	4.6	14.6
7	4	-6.0	294	.251	5	5.1	14.2
7	5	-6.0	288	.324	5	5.2	14.1
7	6	-6.0	289	.334	5	5.2	14.1
7	7	-6.0	288	.329	5	5.2	14.1

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
8	1	-6.0	290	.305	10	4.5	14.7
8	2	-6.0	291	.312	10	4.7	14.5
8	3	-6.0	291	.405	10	4.9	14.3
8	4	-6.0	292	.468	10	5.1	14.2
8	5	-6.0	290	.520	10	5.3	14.0
8	6	-6.0	285	.505	10	5.5	13.8
8	7	-6.0	288	.642	15	5.3	14.0

DATE = 5/24/88  
 LOCATION = BAG INLET CENTER  
 FILE IDENTITY = BAG\_CENTER  
 BAROMETRIC PRESSURE = 25.36  
 PROBE IDENTITY = E-45  
 DUCT HEIGHT = 18.0  
 DUCT WIDTH = 19.3

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
1	1	-6.0	305	.461	15	4.7	14.5
1	2	-6.0	307	.086	40	4.6	14.6
1	3	-6.0	310	.114	40	4.3	14.9
1	4	-6.0	312	.227	20	4.6	14.6
1	5	-6.0	314	.020	0	4.3	14.9
1	6	-6.0	308	.086	40	4.2	15.0
1	7	-6.0	310	.368	15	4.3	14.9

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
2	1	-6.0	311	.053	15	4.6	14.6
2	2	-6.0	307	.043	0	4.5	14.7
2	3	-6.0	310	.290	15	4.4	14.8
2	4	-6.0	313	.283	15	4.3	14.9
2	5	-6.0	313	.366	15	4.4	14.8
2	6	-6.0	311	.166	10	4.4	14.8
2	7	-6.0	310	.070	10	4.4	14.8

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
3	1	-6.0	305	.246	10	4.6	14.6
3	2	-6.0	305	.307	0	4.4	14.8
3	3	-6.0	306	.456	0	4.3	14.9
3	4	-6.0	311	.434	0	4.3	14.9
3	5	-6.0	313	.459	0	4.3	14.9
3	6	-6.0	311	.488	0	4.4	14.8
3	7	-6.0	308	.322	10	4.4	14.8

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
4	1	-6.0	302	.236	0	4.5	14.7
4	2	-6.0	305	.358	5	4.2	15.0
4	3	-6.0	306	.537	0	4.2	15.0
4	4	-6.0	306	.505	0	4.1	15.0
4	5	-6.0	309	.483	0	4.2	15.0
4	6	-6.0	312	.488	10	4.1	15.0
4	7	-6.0	311	.463	5	4.0	15.1

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
5	1	-6.0	305	.268	10	4.0	15.1
5	2	-6.0	305	.385	5	4.1	15.0
5	3	-6.0	306	.571	0	4.1	15.0
5	4	-6.0	309	.507	0	4.0	15.1
5	5	-6.0	313	.485	5	4.1	15.0
5	6	-6.0	313	.493	10	4.0	15.1
5	7	-6.0	311	.429	5	4.0	15.1

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
6	1	-6.0	307	.217	0	4.2	15.0
6	2	-6.0	309	.410	0	4.1	15.0
6	3	-6.0	313	.425	10	4.0	15.1
6	4	-6.0	316	.412	5	4.0	15.1
6	5	-6.0	319	.437	5	4.0	15.1
6	6	-6.0	315	.380	5	4.1	15.0
6	7	-6.0	315	.271	0	4.1	15.0

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
7	1	-6.0	310	.075	40	4.3	14.9
7	2	-6.0	314	.017	10	4.1	15.0
7	3	-6.0	316	.278	20	4.0	15.1
7	4	-6.0	316	.148	20	3.9	15.2
7	5	-6.0	317	.190	15	4.0	15.1
7	6	-6.0	316	.136	5	4.1	15.0
7	7	-6.0	314	.095	10	4.0	15.1

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
8	1	-6.0	311	.485	0	4.0	15.1
8	2	-6.0	313	.168	25	4.1	15.0
8	3	-6.0	315	.107	30	4.0	15.1
8	4	-6.0	319	.473	15	3.9	15.2
8	5	-6.0	316	.041	50	4.0	15.1
8	6	-6.0	314	.136	40	4.0	15.1
8	7	-6.0	314	.258	20	4.0	15.1

DATE = 5/23/88  
 LOCATION = BAGHOUSE INLET WEST  
 FILE IDENTITY = BAG\_WEST  
 BAROMETRIC PRESSURE = 25.36  
 PROBE IDENTITY = E-45  
 DUCT HEIGHT = 18.0  
 DUCT WIDTH = 19.3

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
1	1	-6.0	288	.212	10	5.1	14.2
1	2	-6.0	289	.285	5	5.4	13.9
1	3	-6.0	288	.339	5	5.5	13.8
1	4	-6.0	287	.397	5	5.7	13.6
1	5	-6.0	283	.554	0	6.2	13.2
1	6	-6.0	282	.798	0	6.6	12.8
1	7	-6.0	281	1.377	0	6.8	12.6

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
2	1	-6.0	293	.185	0	5.2	14.1
2	2	-6.0	295	.131	0	5.3	14.0
2	3	-6.0	302	.205	5	5.6	13.7
2	4	-6.0	294	.217	0	5.9	13.4
2	5	-6.0	290	.261	5	6.2	13.2
2	6	-6.0	290	.459	5	6.5	12.9
2	7	-6.0	289	.263	5	6.5	12.9

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
3	1	-6.0	282	.129	5	5.1	14.2
3	2	-6.0	295	.141	0	5.2	14.1
3	3	-6.0	287	.183	5	5.4	13.9
3	4	-6.0	294	.197	0	5.7	13.6
3	5	-6.0	294	.275	0	6.1	13.3
3	6	-6.0	290	.261	5	6.2	13.2
3	7	-6.0	290	.383	10	5.9	13.4

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
4	1	-6.0	305	.246	5	5.0	14.2
4	2	-6.0	306	.297	0	5.1	14.2
4	3	-6.0	298	.256	10	5.0	14.2
4	4	-6.0	300	.271	10	5.5	13.8
4	5	-6.0	296	.334	5	5.9	13.4
4	6	-6.0	297	.500	0	6.1	13.3
4	7	-6.0	294	.429	5	5.7	13.6

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
5	1	-6.0	300	.297	0	4.9	14.3
5	2	-6.0	307	.180	5	5.1	14.2
5	3	-6.0	316	.324	5	5.2	14.1
5	4	-6.0	297	.346	5	5.5	13.8
5	5	-6.0	297	.239	5	5.8	13.5
5	6	-6.0	295	.273	5	5.9	13.4
5	7	-6.0	295	.356	0	5.7	13.6

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
6	1	-6.0	301	.236	5	4.9	14.3
6	2	-6.0	303	.173	0	4.7	14.5
6	3	-6.0	302	.244	0	5.0	14.2
6	4	-6.0	295	.422	0	5.3	14.0
6	5	-6.0	295	.390	0	5.8	13.5
6	6	-6.0	295	.268	0	5.7	13.6
6	7	-6.0	296	.476	5	5.7	13.6

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
7	1	-6.0	304	.197	15	4.9	14.3
7	2	-6.0	301	.179	10	4.8	14.4
7	3	-6.0	301	.144	15	4.8	14.4
7	4	-6.0	296	.034	0	5.3	14.0
7	5	-6.0	290	.034	5	5.6	13.7
7	6	-6.0	290	.136	5	5.9	13.4
7	7	-6.0	294	.429	10	5.7	13.6

TAP	POINT	STAT P	TEMP	DELTA P	YAW ANGL	%O2	% CO2
8	1	-6.0	306	.373	5	4.8	14.4
8	2	-6.0	301	.493	5	4.9	14.3
8	3	-6.0	299	.092	0	5.1	14.2
8	4	-6.0	293	.649	0	5.2	14.1
8	5	-6.0	293	.092	15	5.4	13.9
8	6	-6.0	294	.222	5	5.5	13.8
8	7	-6.0	298	.502	0	5.5	13.8

IP14\_000732

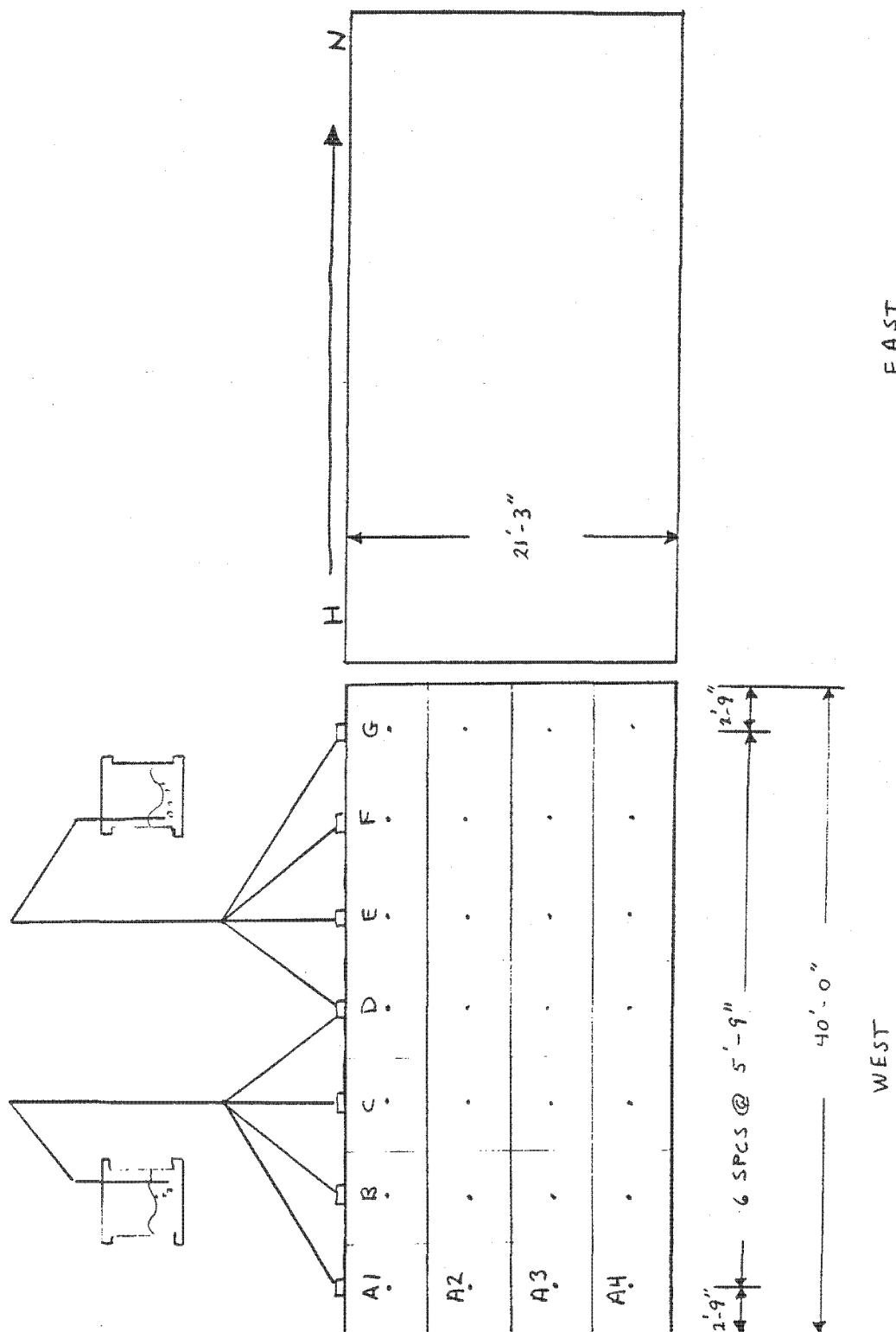
APPENDIX 5  
GAS SAMPLING GRID SKETCHES

IP14\_000733

BOS-1979

BABCOCK & WILCOX

## GENERAL CALCULATIONS



JSTOMER

INTERMOUNTAIN POWER PROJECT

FILE NO.

RB-614

SUBJECT

ECONOMIZER GAS OUTLET SAMPLING GRID

PREPARED BY

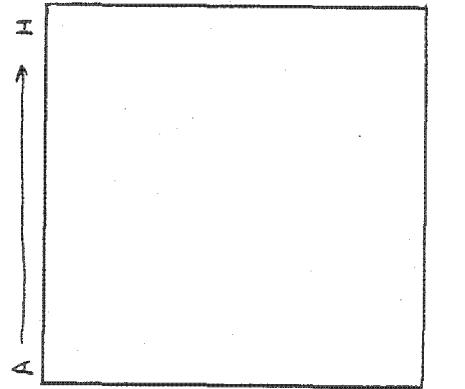
JDR

DATE

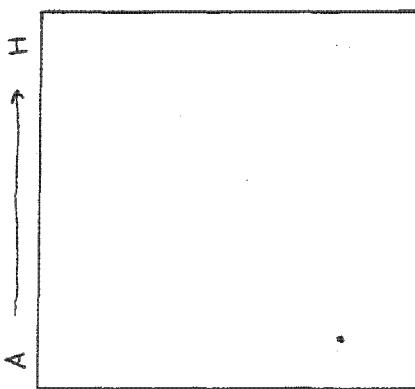
5-25-79

IP14\_000734

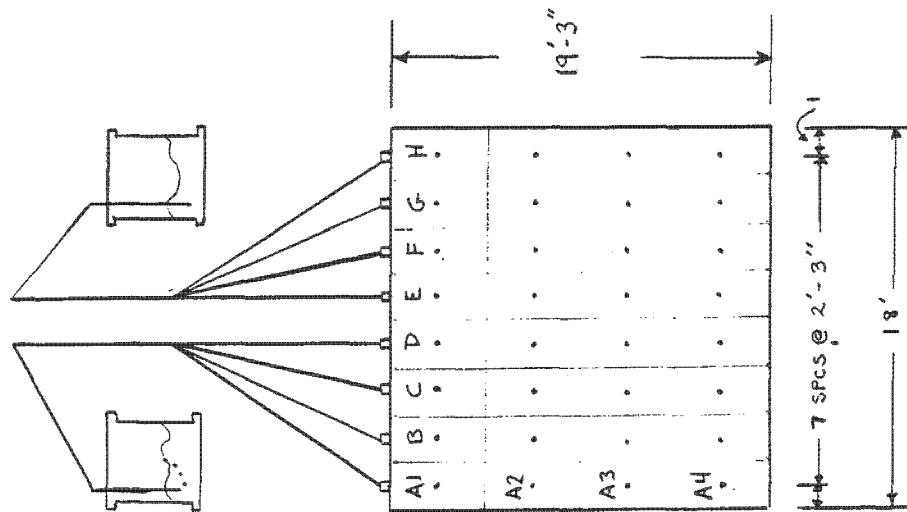
## GENERAL CALCULATIONS



EAST



CENTER



WEST

CENTER DUCT DIVIDED EQUALLY BETWEEN EAST AND WEST.

JSTOMER  
INTERMOUNTAIN POWER PROJECT

FILE NO.

RB-614

SUBJECT

BAGHOUSE INLET GAS SAMPLING GRIDS

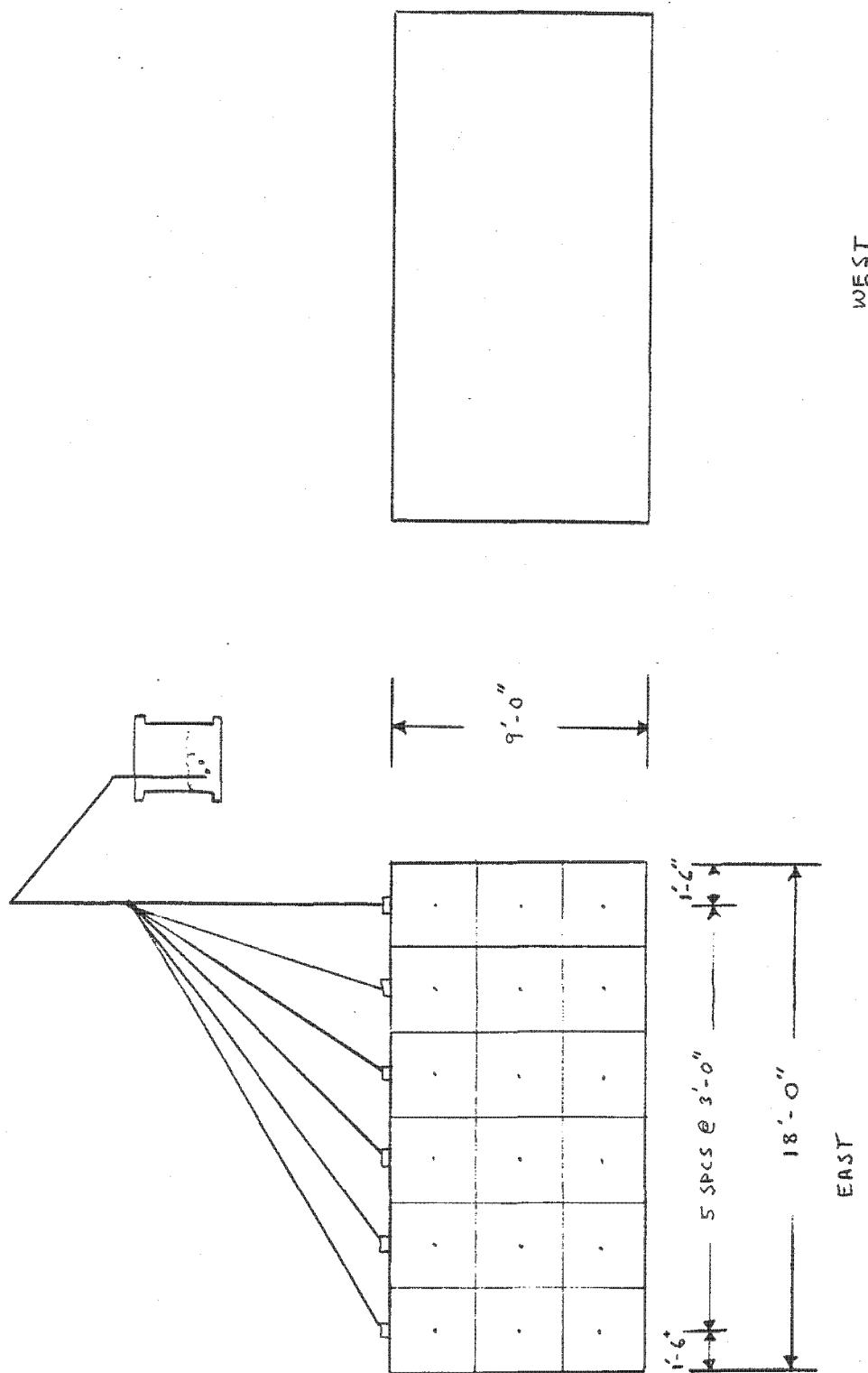
PREPARED BY  
JDRDATE  
5-25-88

IP14\_000735

BDS-1979

BABCOCK & WILCOX

## GENERAL CALCULATIONS



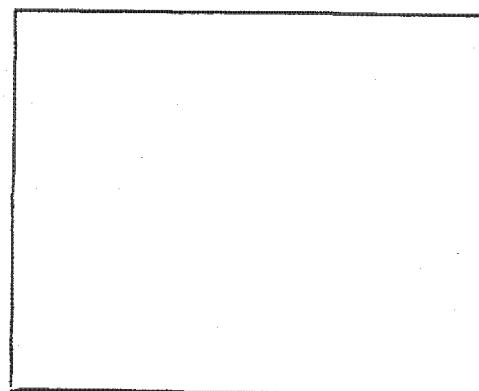
STOMER	INTERMOUNTAIN POWER PROJECT	FILE NO. RB-614
SUBJECT	PRIMARY AIR HEATER GAS INLET SAMPLING GRID	PREPARED BY JDR      DATE 5-25-88

IP14\_000736

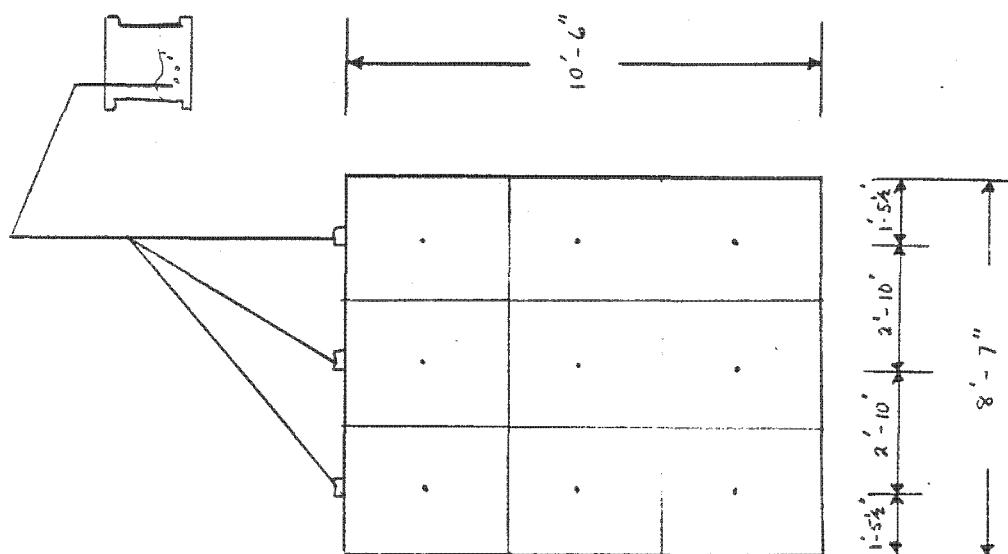
BDS-1979

BABCOCK & WILCOX

## GENERAL CALCULATIONS



WEST



JSTOMER INTERMOUNTAIN POWER PROJECT	FILE NO. RB-614
SUBJECT PRIMARY AIR HEATER GAS OUTLET SAMPLING GRID	PREPARED BY JDR DATE 5-25-88

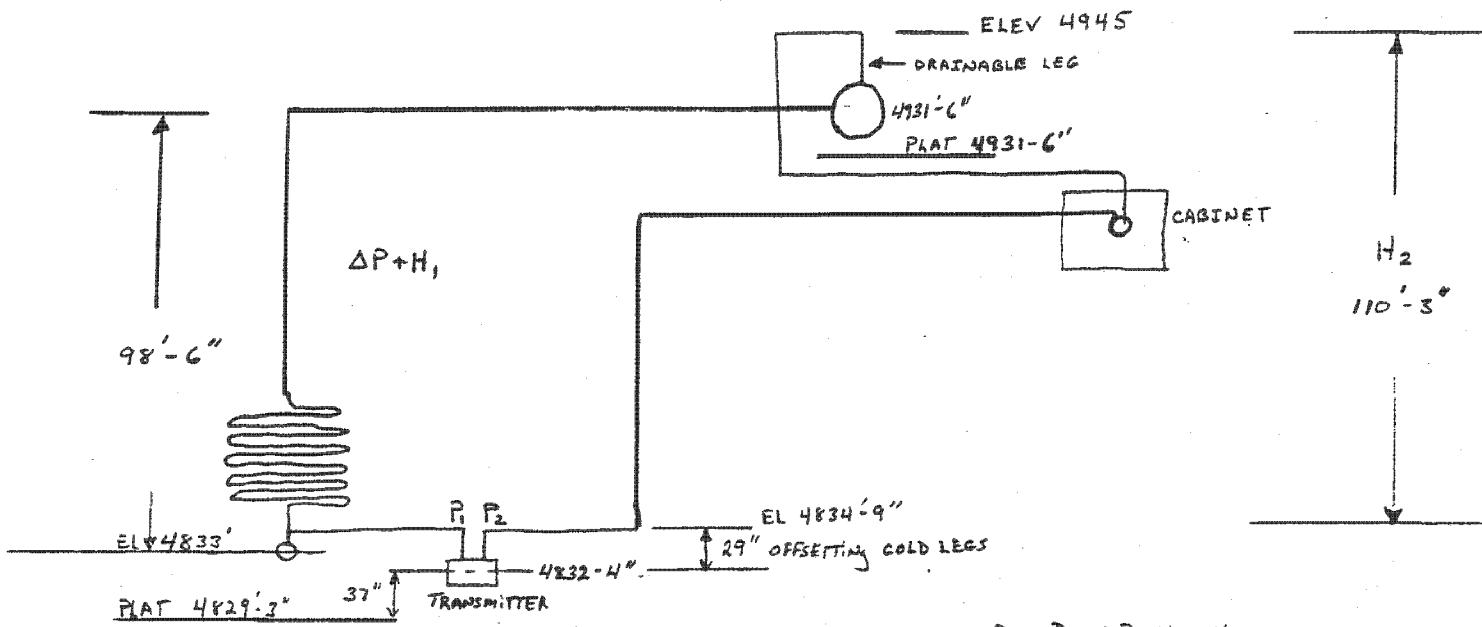
IP14\_000737

**IP14\_000738**

**APPENDIX 6**

**PRESSURE DROP, AIR RESISTANCE, AND DRAFT LOSS CALCULATIONS**

ECONOMIZER PRESSURE DROP



$$v_1 = .02130 \text{ @ } 2760 \text{ PSI, } 549^\circ\text{F}$$

$$v_2 = .02180 \text{ @ } 2735 \text{ PSI, } 580^\circ\text{F}$$

$$v_{avg} = .02160$$

$$v_3 = .01595 \text{ @ } 2735, 90^\circ\text{F}$$

$$P_2 = P_1 - \Delta P - H_1 + H_2$$

$$\Delta P = (P_1 - P_2) - H_1 + H_2$$

$$H_1 = 98.5 / v_{avg} * 144 = 31.67$$

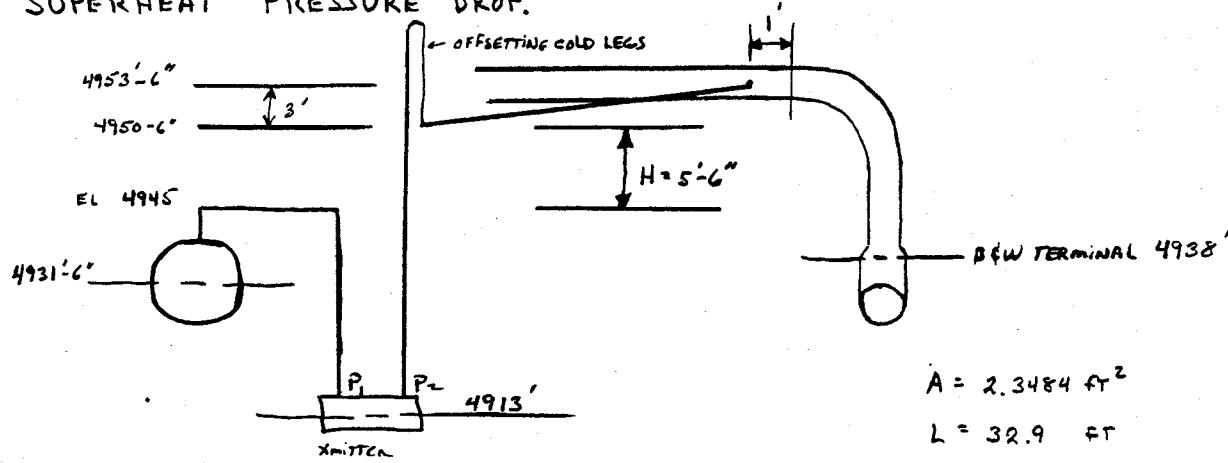
$$H_2 = 110.25 / v_3 * 144 = 48.0$$

TEST NO.	ACTUAL READING	CORRECTED FOR STATIC + COLD LEG (+ 16.33 PSI)	CORRECTED FOR VALVE PRESS DROP (9.7 PSI)	CORRECTED FOR FLOW (Flow guage/Flow act) <sup>2</sup>
2A	34.95	51.28	41.58	41.16
3A	34.94	51.27	41.57	41.59
4A	34.07	50.40	40.70	41.55
5A	34.23	50.56	40.86	41.27
6A	34.35	50.68	40.98	41.60

$$\text{AVG. VALUE} = 41.43 \text{ PSI}$$

NOT TO EXCEED 25.0 PSI. ONE OF THE VALVES MUST BE SCREWED UP.  
IT IS NOT POSSIBLE TO BE THAT MUCH DIFFERENT THAN THE IDENTICAL ECON  
ON UNIT #1

SUPERHEAT PRESSURE DROP.



$$A = 2.3484 \text{ ft}^2$$

$$L = 32.9 \text{ ft}$$

$$d = 20.75 \text{ in}$$

$$P_2 = P_1 - \Delta P - \Delta P_{CUST} + H$$

$$\frac{\rho}{\rho_0} = .0074$$

$$\Delta P = P_1 - P_2 = - \Delta P_{CUST} + H$$

$$H = 5.5 / .01601 * 144 = 2.38$$

TEST NO.	SPM FLOW	G	V	$\gamma$	f	RE	$(\frac{G}{100,000})^2$
2A	6167.1	2,628,086	.3250	.077	.012	$5.9 \times 10^7$	690.68
3A	6163.9	2,624,723	.3250	.077	.012	$5.89 \times 10^7$	688.92
4A	6177.8	2,630,642	.3250	.077	.012	$5.9 \times 10^7$	692.03
5A	6142.0	2,615,398	.3250	.077	.012	$5.87 \times 10^7$	684.03
6A	6142.8	2,615,738	.3250	.077	.012	$5.87 \times 10^7$	684.21

$$\Delta P_{CUST} = \Delta P_{FRICTION} + \Delta P_{BEND1} + \Delta P_{BEND2} + \Delta P_{TRANSITION} + \Delta P_{HEIGHT}$$

$$\Delta P_{FRICTION} = f L v / d \left( \frac{G}{100,000} \right)^2$$

$$\Delta P_{BEND} = \left[ a K_{BEND} \left( \frac{f}{f_s} \right) \phi - \frac{b f}{57.3} \left( \frac{R}{D} \right) \right] \times \frac{v^2}{2} \times \left( \frac{G}{100,000} \right)^2$$

$$\Delta P_{TRANSITION} = .05 v^2 / 12 \left( \frac{G}{100,000} \right)^2$$

$$\Delta P_{HEIGHT} = 15.5 / (v \times 144)$$

TEST NO	FRICTION	BEND1	BEND2	TRANSITION	HEIGHT	CUSTOMER DP
2A	4.27	1.99	.73	.94	.33	8.26
3A	4.26	1.98	.73	.93	.33	8.23
4A	4.28	1.99	.74	.94	.33	8.28
5A	4.23	1.97	.73	.93	.33	8.19
6A	4.23	1.97	.73	.93	.33	8.19

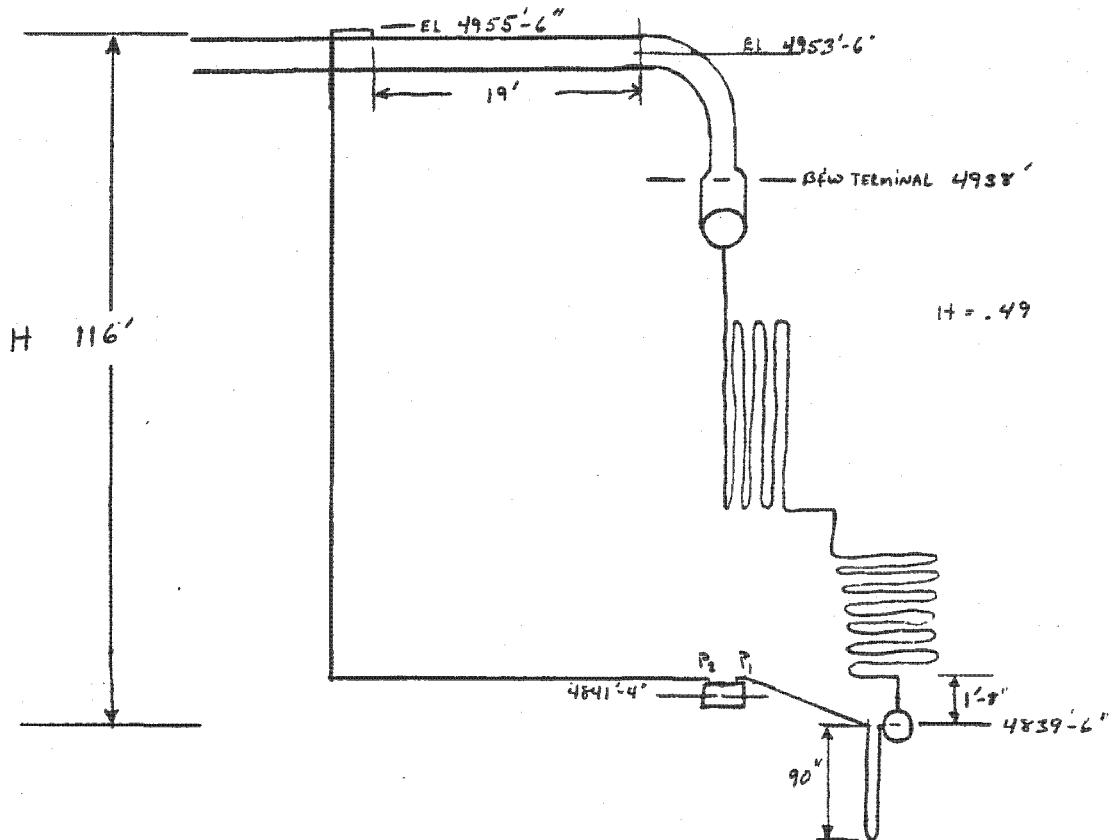
SUPERHEAT PRESSURE DROP (CONT)

TEST NO.	ACTUAL READING	CORRECTED FOR CUSTOMER PIPING	CORRECTED FOR COLD LEG	CORRECTED FOR FLOW
2A	167.5	159.24	161.62	158.12
3A	168.3	160.07	162.45	159.10
4A	166.2	157.92	160.30	156.29
5A	165.8	157.61	159.99	157.81
6A	165.4	157.21	159.59	157.37

Avg = 157.74

IP14\_000742

REHEAT PRESSURE DROP.



$$P_2 = P_1 - \Delta P - \Delta P_{CUST} + H$$

$$d = 32.165$$

$$\Delta P = P_1 - P_2 - \Delta P_{CUST} + H$$

$$A = 5.642 \times$$

$$H = 116' / .01607 \times 144 = 50.12$$

$$L = 55.0 \text{ FT}$$

TEST NO.	G	V	q	f	Re	$(S_{100,000})^2$	FLOW
2A	443,990.6	1.713	.073	.011	$1.63 \times 10^7$	19.71	5010.7
3A	444,327.3	1.693	.073	.011		19.74	5014.5
4A	449,643.8	1.693	.073	.011		20.22	5074.5
5A	443,042.5	1.713	.073	.011		19.63	5000.0
6A	443,414.6	1.700	.073	.011		19.62	5004.2

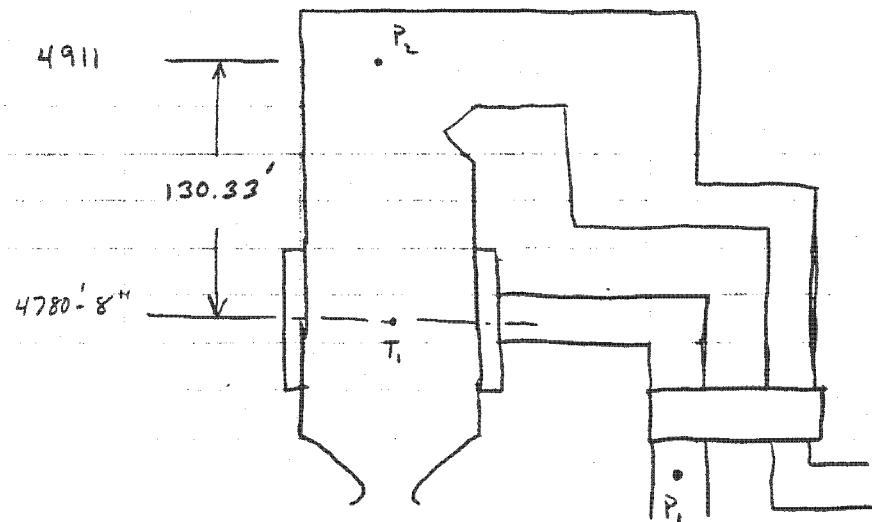
TEST NO.	FRICTION	BEND1	BEND2	TRANSITION	HEIGHT	CUSTOMER $\Delta P$
2A	.6351	.1877	.1324	.1418	.0628	1.16
3A	.6286	.1858	.1316	.1404	.0636	1.15
4A	.6439	.1903	.1342	.1438	.0636	1.18
5A	.6325	.1870	.1318	.1412	.0628	1.16
6A	.6274	.1854	.1307	.1401	.0633	1.15

REHEAT PRESSURE DROP (CONT)

TEST NO.	ACTUAL READING	CORRECTED FOR COLD LEG	CORRECTED FOR CUSTOMER PIPING	CORRECTED FOR FLOW
2A	- 24.54	25.58	24.42	23.59
3A	- 24.47	25.65	24.50	23.63
4A	- 24.49	25.63	24.45	23.03
5A	- 24.72	25.40	24.24	23.52
6A	- 24.54	25.58	24.43	23.66
			Avg =	23.49

IP14\_000744

AIR SIDE PRESSURE DROP



$$P_2 = P_1 - \Delta P - \text{STACK EFFECT}$$

$$\rho_{60} = .0795$$

$$\Delta P = (P_1 - P_2) - \text{STACK EFFECT}$$

$$\text{STACK EFFECT} = H * 7.63 * \left( \frac{B_p}{29.92} \right) \left[ \frac{1}{T_{\text{AMB}} + 460} - \frac{\ln \left( \frac{T_1 + 460}{T_2 + 460} \right)}{T_1 - T_2} * \frac{\rho_{60}}{.07655} * \left( 1 + \frac{P}{13.6 B_p} \right) \right]$$

TEST #	FEGT ( $T_1$ )	$T_1$	$B_p$	$T_{\text{AMB}}$	$(P_1 - P_2)$	STACK EFFECT
2A	2175	3500	25.35	68	5.85	1.33"
3A	2175	3500	25.24	69	6.15	
4A	2175	3500	25.36	67	5.95	
5A	2175	3500	25.47	64	5.85	
6A	2175	3500	25.47	71	5.95	
Avg.	2175	3500	25.38	68		1.33

TEST #	$(P_1 - P_2) + \text{STACK EFFECT}$	CORRECTED FOR FLOW	REMOVE STACK EFFECT
2A	7.18	7.23	5.90
3A	7.48	7.28	5.95
4A	7.28	6.86	5.54
5A	7.18	7.14	5.82
6A	7.28	7.41	<u>6.08</u>

$$\text{AVG.} = 5.86$$

|P14\_000745

GAS SIDE PRESSURE DROP

TEST #	$(P_1 - P_2)$ - STACK EFFECT	CORRECTED FOR FLOW	STACK EFFECT ADDED
2A	4.97	4.62	5.95
3A	5.12	4.58	5.91
4A	5.12	4.48	5.81
5A	4.92	4.66	5.99
6A	4.92	4.66	<u>5.99</u>

Avg = 5.93

IP14\_000746

PRI AH LEAKAGE  
CORRECTED FOR  $\Delta P$

$$W_L \text{ CORRECTED} = W_L \text{ MEASURED} \left[ \frac{\Delta P_{\text{DESIGN}}}{\Delta P_{\text{ACTUAL}}} \left( \frac{T_{\text{AIR ENT}}}{T_{\text{AIR DESIGN}}} \right) \right]^{\frac{1}{2}}$$

TEST #	MEASURED LEAKAGE	$\Delta P_{\text{ACTUAL}}$	T <sub>AIR ENT</sub>	CORRECTED LEAKAGE
2A	142	44.05	89	132.0
3A	176	44.85	89	162.2
4A	161	44.85	88	148.3
5A	158	44.8	86	145.3
6A	164	45.2	93	<u>151.1</u>
				AVG = 147.8

SEC. AH LEAKAGE  
CORRECTED FOR  $\Delta P$

TEST #	MEASURED LEAKAGE	$\Delta P_{\text{ACTUAL}}$	T <sub>AIR ENT</sub>	CORRECTED LEAKAGE
2A	229	12.12	68	236.7
3A	287	12.6	69	291.2
4A	227	12.4	67	231.7
5A	222	12.0	64	229.7
6A	230	12.25	71	<u>237.1</u>
				AVG = 245.3

## NOX

$$F = \frac{10E6 [3.64H + 1.53C + .575 + .14N - .46O_2]}{HHV}$$

$$F = .0098 E^6$$

$$E = 119.16 E^{-9} * F * \left( \frac{20.9}{20.9 - O_2} \right) = .001168 * PPM * \left( \frac{20.9}{20.9 - O_2} \right)$$

TEST #	NOX PPM	O <sub>2</sub>	NOX lbs/mkB	NOX Lbs/mkB CORR O <sub>2</sub> %
2A	328.5	3.0	.38	.44
3A	249.8	3.1	.29	.34
4A	270.8	3.24	.32	.38
5A	234.7	3.1	.27	.32
6A	204.3	3.0	.24	.28
7A1	152.2	6.6	.18	.26
7A2	152.6	5.8	.18	.25
8A	175.9	3.62	.21	<u>.25</u>
			Avg	.31

IP14\_000748

IP14\_000749

**APPENDIX 7**

**AVERAGE FUEL ANALYSIS AND CARBON LOSS CALCULATIONS**

AVERAGE FUEL ANALYSIS (AS FIRED)

TEST NO.	HHV	MOISTURE	CARBON	HYDROGEN	NITROGEN	ASH	SULFUR	O <sub>2</sub>
2	11,964	8.16	67.22	5.03	1.06	8.14	.54	9.85
3	11,835	8.21	67.00	4.96	.94	8.08	.47	10.34
4	11,937	7.77	67.56	4.98	1.05	8.05	.52	10.07
5	11,840	8.71	66.76	4.91	.91	7.65	.51	10.55
6	11,777	8.94	66.61	4.81	.98	7.40	.43	10.83
7	11,849	8.77	66.37	5.01	1.01	8.28	.53	10.01
8	11,961	8.44	66.95	5.12	1.01	7.84	.52	10.12
NOT OFFICIAL								
1	11,551	9.54	65.32	4.78	.96	8.69	.46	10.25

TEST NO. THEOR. AIR (7.56 ± .15)

2	7.585	✓
3	7.605	✓
4	7.612	✓
5	7.558	✓
6	7.541	✓
7	7.563	✓
8	7.576	✓
NOT OFFICIAL		
1	7.574	✓

UNBURNED CARBON

TEST NO.	CARBON IN FLYASH	CARBON IN ECON HOPPER	CARBON IN BOTTOM ASH
2A	.56	.62	.75
3A	.92	1.31	.78
4A	1.24	.59	1.03
5A	.56	.36	.41
6A	.50	.11	.29
7A	.81	.68	.81
8A	.77	.51	.52
NOT OFFICIAL			
1A	.91	.81	.84

ASSUME SPLIT OF 80-5-15% TO FLYASH / ECON / BOTTOM

TEST NO.	% ASH	FLYASH	ECON HOPPER	BOTTOM ASH	Avg. C IN REFUSE	UBC
2A	8.14	.45	.031	.112	.59	.048
3A	8.08	.736	.065	.117	.92	.075
4A	8.05	.992	.029	.154	1.18	.096
5A	7.65	.448	.018	.615	.53	.041
6A	7.40	.40	.006	.044	.45	.034
7A	8.28	.65	.034	.122	.81	.068
8A	7.84	.62	.025	.078	.72	.057
NOT OFFICIAL						
1A	8.69	.73	.041	.126	.90	.079

where  $UBC = \frac{\% \text{ ASH} - \text{Avg C in Refuse}}{1 - \text{Avg C in Refuse}}$

**IP14\_000753**

**APPENDIX 8**  
**AIR AND GAS FLOW CALCULATION METHODOLOGY**

**IP14\_000754**

## CALCULATION METHODOLOGY FOR SECONDARY AIR HEATER GAS OUTLET CONDITIONS AND AIR/GAS FLOW DISTRIBUTION

The secondary air heater gas outlet temperature and gas analysis can not be measured directly on this unit due to the arrangement of the air heater gas outlet flues. However, the sampling locations are excellent for the primary air heater gas outlet and composite of all the air heater gas outlets, and can be measured with the accuracy equivalent to any unit. Since two out of three locations can be measured, the third location (secondary air heater gas outlet) can be calculated as accurately as the measurements at any of the other locations.

Below is the calculation methodology used for this contract.

Attachment C contains a summary of the sampling locations and the measurements that were performed at each location, as well as sketches showing the sampling grid size for each test station. With the exception of the air heater air inlets, the temperatures, O<sub>2</sub> and CO<sub>2</sub> were weight averaged based on the velocity head measurements. Input (fuel flow) was calculated based on measured output and efficiency calculated per PTC 4.1, Heat Loss Method.

For heat balance calculations, B&W enthalpy/specific heat of air and flue gas are based upon NASA-272.

Referring to the attached schematic of the actual arrangement of the air heaters, Figure 1, calculate the following (the average of two air heaters is depicted below for simplicity, however, there is sufficient test data that calculations may be performed on an individual air heater basis):

1. Total gas flow to air heaters, Wg14 - Calculate per PTC 4.3/4.1 based on O<sub>2</sub> & CO<sub>2</sub> leaving the economizer, and fuel input.
- 2A. APCO method for calculating gas flow to individual air heaters - Gas flow is calculated by proportioning the total calculated gas flow to the air heaters (Item 1 above) based on the measured gas flow entering the air heaters.

$$Wgm14 = Wgm14A + Wgm14B = \text{Total measured gas flow to air heaters.}$$

$$Wg14 = \text{Total calculated gas flow to air heaters.}$$

$$Wg14A = Wgm14A * Wg14 / Wgm14 = \text{Gas flow to secondary AH's.}$$

$$Wg14B = Wgm14B * Wg14 / Wgm14 = \text{Gas flow to primary AH's}$$

- 2B. B&W method for calculating gas flow to individual air heaters - Calculate gas flow through the primary air heater by heat balance based on measured primary air flow to the pulverizers. Secondary air heater gas flow is the difference between total gas flow to the air heaters and gas flow entering the primary air heater.

$$Wg14B = Wam11 * (Ham11 - Ha8B) / (Hg14B - Hg15B)$$
$$Wg14A = Wg14 - Wg14B$$

Where:

Wam11 = Measured air flow to pulverizers (plant computer).  
Ham11 = Average enthalpy of air entering pulverizers, Btu/lbm.  
Hg = Enthalpy of flue gas, Btu/lbm. See below.

3. Calculate the primary air heater leakage, Wah115B, conventionally per PTC 4.3.
4. Calculate the gas temperature leaving the primary air heater excluding leakage, Tg15BNL, conventionally per PTC 4.3.

Figure 2 is an equivalent schematic of the air heaters for purposes of explaining the calculation of total air heater leakage and secondary air heater gas outlet temperature excluding leakage. Individual secondary air heater performance may be calculated using measured data from the right or left side of the boiler.

5. Calculate total air heater leakage, Wah115, per PTC 4.3 conventionally based on O2 and CO2 measurements at [14] and [15].
6. Calculate the secondary air heater leakage, Wah115A, by difference.

$$Wah115A = Wah115 - Wah115B$$

7. Calculate the gas temperature leaving the heaters excluding leakage, Tg15NL, per PTC 4.3 conventionally based on the average air temperature of the infiltrating air, Tah115.

$$Tah115 = (Tah115A * Wah115A + Tah115B * Wah115B) / Wah115$$

8. Calculate the gas temperature leaving the secondary air heater(s) excluding leakage, Tg15ANL, by heat balance in accordance with the following equations:

$$Tg15ANL f(Hg15ANL) \text{ where } Hg15ANL = \text{Enthalpy of flue gas @ Tg15ANL}$$

$$Hg15ANL = (Wg15NL * Hg15NL - Wg15BNL * Hg15BNL) / Wg15ANL$$

The enthalpy of flue gas required in the equation above is a function of moisture in the flue gas as well as the dry flue gas composition. Moisture in flue gas is a function of excess air at the location in question, and must be calculated for each location as described below.

9. Calculate moisture in flue gas leaving the economizer, M14, and moisture entering the primary air heater, M14B, per PTC 4.3.
10. Calculate moisture in flue gas leaving the secondary air heater by mass balance per the following equation:

$$M14A = (M14 * Wg14 - M14B * Wg14B) / Wg14A$$

11A. APCO method - Calculate air flow through individual air heaters by heat balance.

11B. B&W method - Calculate air flow through the primary air heater by heat balance. Secondary air flow is the difference between total air flow to the burners less the primary air flow. Total air flow to the burners is calculated stoichiometrically assuming 2 % setting infiltration at full load.

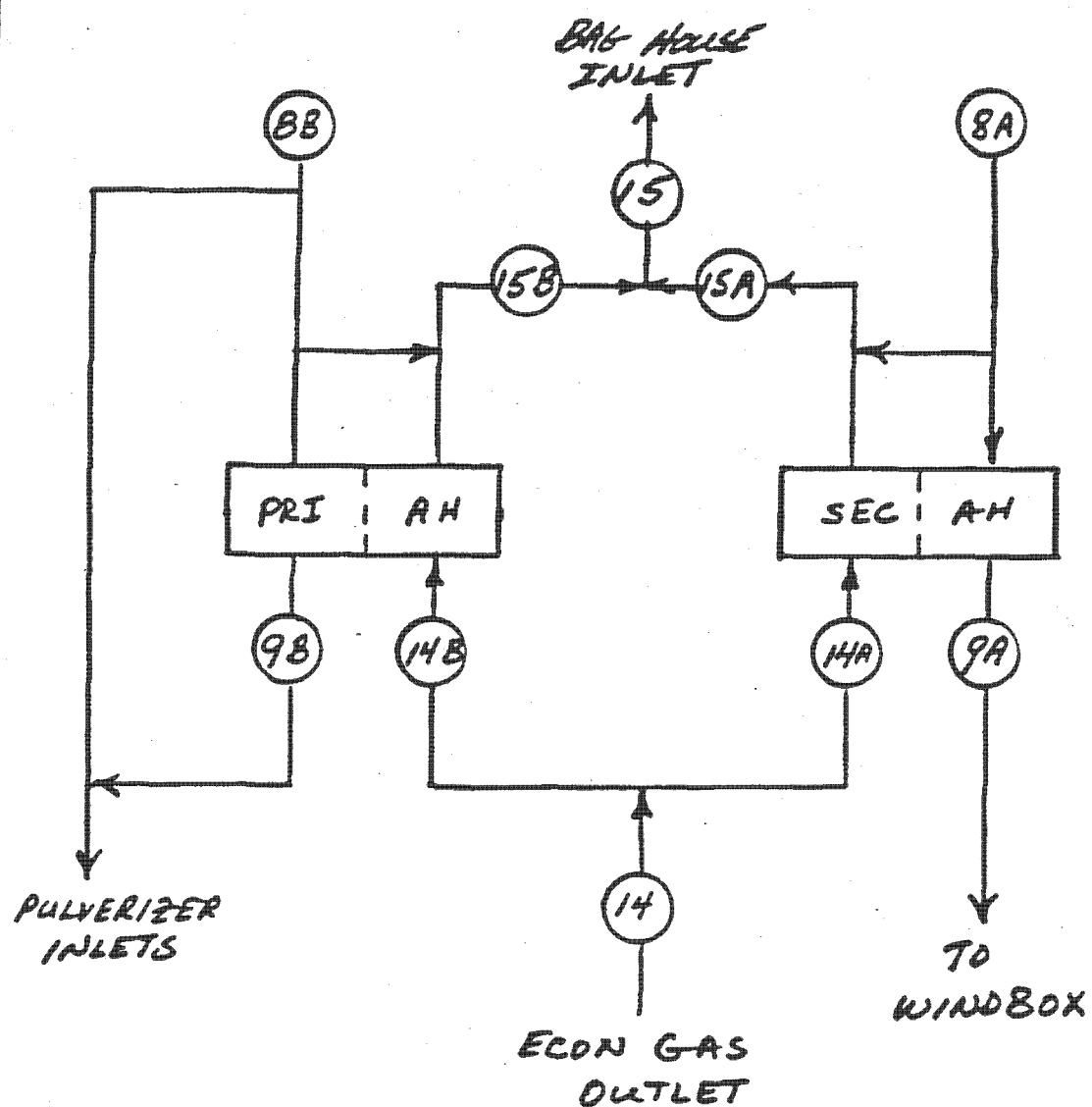


FIG. 1 - SCHEMATIC OF PHYSICAL ARRANGEMENT

BABCOCK &amp; WILCOX

DEPARTMENT

IPP

DATE 6/8/87 BY TCH

CHECKED DATE BY

JOB NO.

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SHEET \_\_\_\_\_ OF \_\_\_\_\_

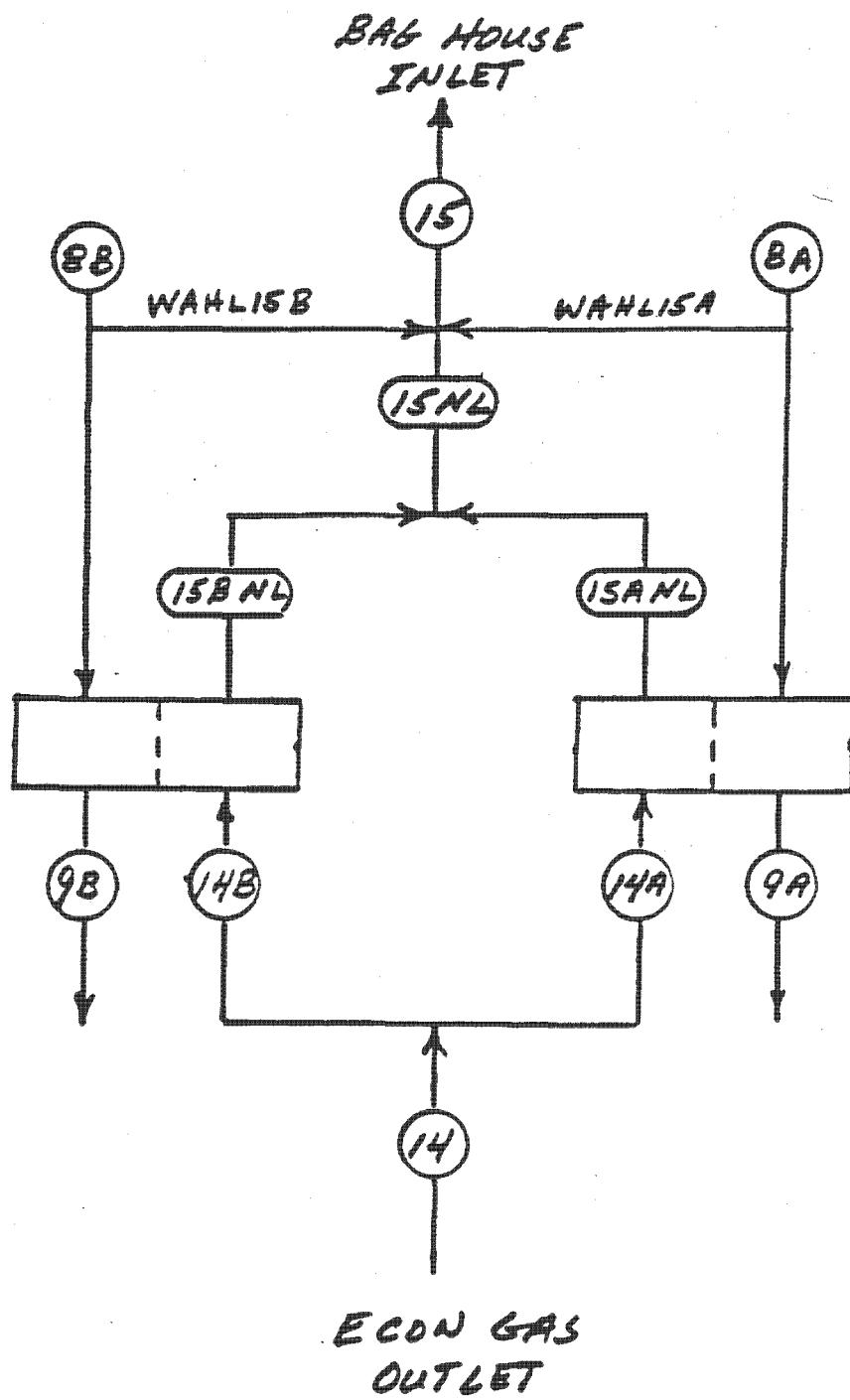


FIG. 2 - SCHEMATIC EQUIVALENT  
FOR NO LEAKAGE

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## SEQUENCE OF CALCULATIONS

TESTS 3A, 4A, 5A - O<sub>2</sub> / Plant Measured PA Flow  
TESTS 3AC, 4AC, 5AC - CO<sub>2</sub> / Plant Measured PA Flow

1. Efficiency Calculation Sheet - Calculate efficiency based on the composite flue gas analysis entering the bag house. This provides the total gas weight.
2. Air Heater Leakage Calculation Sheet - Composite air heater leakage, economizer gas out to bag house inlet.
3. Secondary AH Gas Outlet Calculation Sheet - Calculate the secondary air heater leakage and gas outlet temperature with and without leakage from total gas weight, total air heater leakage, primary air heater gas flow and leakage.
4. Average Primary and Secondary AH Leakage Calculation Sheet (except tests 3A and 3AC)

TESTS 3MO, 4MO, 5MO - O<sub>2</sub> / Measured air and gas flows  
TESTS 3MC, 4MC, 5MC - CO<sub>2</sub> / Measured air and gas flows

1. Efficiency Calculation Sheet - Calculate efficiency based on the composite flue gas analysis entering the bag house. This provides the total gas weight.
2. Air Heater Leakage Calculation Sheet - Composite air heater leakage, economizer gas out to bag house inlet.
3. Calculation Sheet, Air/Gas Flows - Adjust measured gas flows to agree with total gas weight leaving the economizer on the Efficiency sheet. Calculate primary air heater leakage and gas temperature leaving the primary air heater without leakage. Calculate air flow leaving the primary air heater by heat balance.
4. Primary Air Heater Leakage Calculation Sheet
5. Secondary AH Gas Outlet Calculation Sheet - Calculate the secondary air heater leakage and gas outlet temperature with and without leakage from total gas weight, total air heater leakage, primary air heater gas flow and leakage.
6. Calculate secondary air heater air flow by heat balance (calculation sheet in step 3).
7. Average Primary and Secondary AH Leakage Calculation Sheet (except tests 3MO and 3MC)

TEST 1A : 16Sep88 : 1155-1605 : 850 MW DRY RUN FINAL CALCULATION JDR-110488

CALCULATED SECONDARY AH GAS OUTLET CONDITIONS

	LVG ECON	ENT PRI	LVG PRI	ENT SEC	LVG SEC	TOTAL LVG AH'S
O2,	%	3.07*	2.96*	6.31*	3.07*	3.94
CO2,	%	15.74	15.83	12.87	15.74	14.97
EXCESS AIR,	%	16.7	16.0	42.1	16.7	22.6
H2O IN GAS,	%	5.31	5.34	4.54	5.31	5.10
T AIR,	F		107.1*	520.1*	85.7*	646.3*
H AIR,	BTU/LB		6.6		1.4	
T AIR CALC,	F			520.5		640.1
T GAS,	F	733.2*	721.7*	302.0*	733.2*	307.5
H GAS,	BTU/LB			55.2		56.9
H GASC,	BTU/LB			65.3		59.4
T GAS (W/O LKG), F				339.9		317.2
WT AIR,	KLB/HR			835.1		5236.0
WT GAS,	KLB/HR	7380.0	842.0	1015.6	6538.0	6839.0
AH LKG,	KLB/HR			173.7*		301.0
						7854.7
						474.7*

\* DENOTES MEASURED VALUES.

PRI AH AIR BY-PASS FLOW =	588.6
MOIS IN AIR, LB/LB DA =	.0070
WT AIR LVG SEC BY HT BAL =	5176.3

	CONTRACT SUMMARY SHEET	TEST 1A CORRECTED FOR CONTR. CONDITIONS	TEST 1A WITH TEST CONDITIONS
Fuel		CONTRACT	TEST
Air Temp Ent AH	PRI/SEC F	77/ 64	107/ 86
Air Temp Lvg AH	PRI/SEC F	582/ 647	520/ 646
Air Flow Lvg AH (1)	PRI/SEC MLB/HR	1335/5184	1424/5102
AH Air By-Pass Flow	MLB/HR	497.8	588.6
Mill Inlet Temp	F	397.2	0.0
Ave Air Temp Ent AH	F	66.7	66.8
Gas Temp Lvg Econ	F	736.0	733.2
Gas Flow Ent AH	MLB/HR	7210	7223
Ave Gas Temp Lvg AH (Incl Lkg)	F	281.6	---
Ave Gas Temp Lvg AH (Excl Lkg)	F	294.7	304.8
Excess Air Lvg Econ	%	17.0	17.0
Excess Air Lvg AH	%	---	---
Excess Air to Burners	%	15.0	15.0
AH Leakage	MLB/HR	484	---
Moisture In Air	LB/LB DA	.0067	.0067
Dry Gas Wt Lvg Econ	LB/LB Fuel	---	9.999
Dry Air Wt to Burners	LB/LB Fuel	---	9.471
Wet Gas Wt Lvg Econ	LB/LB Fuel	---	10.554
Losses %			
Dry Gas		4.84	5.19
H2O in Fuel	(2)	5.15	.88
H2 in Fuel		---	4.30
Moisture in Air		.07	.06
Unburned Combustible		.20	.10
Radiation		.17	.17
Unaccounted	(3)	1.00	.50
Summation of Losses		11.43	11.20
Efficiency	%	88.57	88.80
Unit Output	MKB	6691.5	6782.3
Fuel Input	MKB	7555.0	7625.7
Fuel Rate	MLB/HR	686.2	660.2

(1) Includes By-Pass Flow (2) Includes H2 in Fuel Loss  
 (3) Includes Manufacturer's Margin of .5 %

TEST 1A : 16Sep88 : 1155-1605 : 850 MW DRY RUN FINAL COMPOSITE AH JDR-110488

TEST 2A : 19Sep88 : 1025-1530 : 850 MW D MILL OUT FINAL CALCULATION JDR-110488

CALCULATED SECONDARY AH GAS OUTLET CONDITIONS

	LVG ECON	ENT PRI	LVG PRI	ENT SEC	LVG SEC	TOTAL LVG AH'S
O2,	%	3.01*	3.02*	5.99*	3.01*	3.68
CO2,	%	15.69	15.68	13.07	15.69	15.10
EXCESS AIR,	%	16.3	16.4	39.0	16.3	20.8
H2O IN GAS,	%	5.06	5.06	4.36	5.06	4.90
T AIR,	F		89.0*	527.4*	67.8*	631.1*
H AIR,	BTU/LB		2.2		-2.9	
T AIR CALC,	F			527.8		643.9
T GAS,	F	724.3*	714.4*	302.0*	724.3*	288.1
H GAS,	BTU/LB			55.1		51.9
H GASC,	BTU/LB			64.6		53.8
T GAS (W/O LKG), F				338.1		295.5
WT AIR,	KLB/HR			730.1		5166.0
WT GAS,	KLB/HR	7310.0	793.5	935.7	6516.5	6746.3
AH LKG,	KLB/HR			142.2*		229.8

\* DENOTES MEASURED VALUES.

PRI AH AIR BY-PASS FLOW = 712.8  
 MOIS IN AIR, LB/LB DA = .0049  
 WT AIR LVG SEC BY HT BAL = 5286.7

		CONTRACT SUMMARY SHEET	TEST 2A CORRECTED FOR CONTR. CONDITIONS	TEST 2A WITH TEST CONDITIONS
Fuel			CONTRACT	TEST
Air Temp Ent AH	PRI/SEC F	77/ 64	77/ 64	89/ 68
Air Temp Lvg AH	PRI/SEC F	582/ 647	0/ 0	527/ 631
Air Flow Lvg AH (1)	PRI/SEC MLB/HR	1335/5184	1443/5068	1443/5166
AH Air By-Pass Flow	MLB/HR	497.8	712.8	712.8
Mill Inlet Temp	F	397.2	0.0	312.8
Ave Air Temp Ent AH	F	66.7	66.9	72.4
Gas Temp Lvg Econ	F	736.0	724.3	724.3
Gas Flow Ent AH	MLB/HR	7210	7207	7310
Ave Gas Temp Lvg AH (Incl Lkg)	F	281.6	---	289.8
Ave Gas Temp Lvg AH (Excl Lkg)	F	294.7	296.6	300.2
Excess Air Lvg Econ	%	17.0	17.0	16.3
Excess Air Lvg AH	%	---	---	22.7
Excess Air to Burners	%	15.0	15.0	14.2
AH Leakage	MLB/HR	484	---	372
Moisture In Air	LB/LB DA	.0067	.0067	.0049
Dry Gas Wt Lvg Econ	LB/LB Fuel	---	10.003	10.929
Dry Air Wt to Burners	LB/LB Fuel	---	9.475	10.357
Wet Gas Wt Lvg Econ	LB/LB Fuel	---	10.558	11.511
Losses	%			
Dry Gas		4.84	5.01	4.99
H2O in Fuel	(2)	5.15	.87	.79
H2 in Fuel		---	4.29	4.34
Moisture in Air		.07	.06	.04
Unburned Combustible		.20	.06	.06
Radiation		.17	.17	.16
Unaccounted	(3)	1.00	.50	.50
Summation of Losses		11.43	10.96	10.88
Efficiency	%	88.57	89.04	89.12
Unit Output	MKB	6691.5	6691.5	6770.5
Fuel Input	MKB	7555.0	7515.2	7597.1
Fuel Rate	MLB/HR	686.2	682.6	635.0

(1) Includes By-Pass Flow (2) Includes H2 in Fuel Loss

(3) Includes Manufacturer's Margin of .5 %

TEST 2A : 19Sep88 : 1025-1530 : 850 MW D MILL OUT FINAL COMPOSITE AH JDR-110488

TEST 3A : 20Sep88 : 1320-1715 : 846 MW E MILL OUT FINAL CALCULATION JDR-110488

CALCULATED SECONDARY AH GAS OUTLET CONDITIONS

	LVG ECON	ENT PRI	LVG PRI	ENT SEC	LVG SEC	TOTAL LVG AH'S
O2,	%	3.09*	2.52*	6.23*	3.09*	3.91
CO2,	%	15.68	16.18	12.92	15.68	14.96
EXCESS AIR,	%	16.9	13.3	41.2	16.9	22.4
H2O IN GAS,	%	5.21	5.34	4.48	5.21	5.01
T AIR,	F		89.2*	526.9*	68.8*	638.8*
H AIR,	BTU/LB		2.2		-2.7	
T AIR CALC,	F			527.4		636.1
T GAS,	F	729.7*	715.4*	300.4*	729.7*	299.4
H GAS,	BTU/LB			54.8		54.8
H GASC,	BTU/LB			66.7		57.3
T GAS (W/O LKG), F				345.4		312.7
WT AIR,	KLB/HR			704.6		5254.0
WT GAS,	KLB/HR	7420.0	776.7	952.3	6643.3	6930.4
AH LKG,	KLB/HR			175.6*		287.1
						7882.7
						462.7*

\* DENOTES MEASURED VALUES.

PRI AH AIR BY-PASS FLOW = 750.2  
 MOIS IN AIR, LB/LB DA = .0070  
 WT AIR LVG SEC BY HT BAL = 5228.7

			TEST 3A CORRECTED FOR CONTR. SHEET	TEST 3A WITH TEST CONDITIONS
Fuel			CONTRACT	TEST
Air Temp Ent AH	PRI/SEC	F	77/ 64	89/ 69
Air Temp Lvg AH	PRI/SEC	F	582/ 647	527/ 639
Air Flow Lvg AH (1)	PRI/SEC	MLB/HR	1335/5184	1455/5078
AH Air By-Pass Flow		MLB/HR	497.8	750.2
Mill Inlet Temp		F	397.2	0.0
Ave Air Temp Ent AH		F	66.7	66.9
Gas Temp Lvg Econ		F	736.0	729.7
Gas Flow Ent AH		MLB/HR	7210	7231
Ave Gas Temp Lvg AH (Incl Lkg)		F	281.6	---
Ave Gas Temp Lvg AH (Excl Lkg)		F	294.7	308.8
Excess Air Lvg Econ		%	17.0	17.0
Excess Air Lvg AH		%	---	---
Excess Air to Burners		%	15.0	15.0
AH Leakage		MLB/HR	484	---
Moisture In Air		LB/LB DA	.0067	.0067
Dry Gas Wt Lvg Econ		LB/LB Fuel	---	10.000
Dry Air Wt to Burners		LB/LB Fuel	---	9.472
Wet Gas Wt Lvg Econ		LB/LB Fuel	---	10.555
Losses		%		
Dry Gas			4.84	5.27
H2O in Fuel		(2)	5.15	.88
H2 in Fuel			---	4.31
Moisture in Air			.07	.06
Unburned Combustible			.20	.09
Radiation			.17	.17
Unaccounted		(3)	1.00	.50
Summation of Losses			11.43	11.28
Efficiency		%	88.57	88.72
Unit Output		MKB	6691.5	6779.2
Fuel Input		MKB	7555.0	7640.3
Fuel Rate		MLB/HR	686.2	645.6

(1) Includes By-Pass Flow (2) Includes H2 in Fuel Loss

(3) Includes Manufacturer's Margin of .5 %

TEST 3A : 20Sep88 : 1320-1715 : 846 MW E MILL OUT FINAL COMPOSITE AH JDR-110488

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TEST 4A : 21Sep88 : 1045-1435 : 850 MW F MILL OUT FINAL CALCULATION JDR-110488

CALCULATED SECONDARY AH GAS OUTLET CONDITIONS

		LVG ECON	ENT PRI	LVG PRI	ENT SEC	LVG SEC	TOTAL LVG AH'S
O2,	%	3.24*	3.04*	6.36*	3.24*	3.88	4.20*
CO2,	%	15.53	15.71	12.78	15.53	14.97	14.68
EXCESS AIR,	%	17.8	16.6	42.5	17.8	22.2	24.5
H2O IN GAS,	%	5.12	5.17	4.41	5.12	4.97	4.91
T AIR,	F		88.1*	524.9*	67.2*	631.8*	
H AIR,	BTU/LB		2.0		-3.1		
T AIR CALC,	F			525.3		632.4	
T GAS,	F	722.4*	707.8*	300.9*	722.4*	293.3	294.2*
H GAS,	BTU/LB			54.9		53.2	53.4
H GASC,	BTU/LB			65.7		55.1	56.2
T GAS (W/O LKG), F				342.1		300.6	305.0
WT AIR,	KLB/HR			704.0		5338.0	0.0
WT GAS,	KLB/HR	7506.0	785.2	946.6	6720.8	6949.2	7895.8
AH LKG,	KLB/HR			161.3*		228.5	389.8*

\* DENOTES MEASURED VALUES.

PRI AH AIR BY-PASS FLOW = 754.8  
 MOIS IN AIR, LB/LB DA = .0071  
 WT AIR LVG SEC BY HT BAL = 5343.6

		CONTRACT SUMMARY SHEET	TEST 4A CORRECTED FOR CONTR. CONDITIONS	TEST 4A WITH TEST CONDITIONS
Fuel				
Air Temp Ent AH	PRI/SEC F	77/ 64	77/ 64	88/ 67
Air Temp Lvg AH	PRI/SEC F	582/ 647	0/ 0	525/ 632
Air Flow Lvg AH (1)	PRI/SEC MLB/HR	1335/5184	1459/5062	1459/5338
AH Air By-Pass Flow	MLB/HR	497.8	754.8	754.8
Mill Inlet Temp	F	397.2	0.0	300.8
Ave Air Temp Ent AH	F	66.7	66.9	71.7
Gas Temp Lvg Econ	F	736.0	722.4	722.4
Gas Flow Ent AH	MLB/HR	7210	7218	7506
Ave Gas Temp Lvg AH (Incl Lkg)	F	281.6	---	294.2
Ave Gas Temp Lvg AH (Excl Lkg)	F	294.7	302.0	305.1
Excess Air Lvg Econ	%	17.0	17.0	17.8
Excess Air Lvg AH	%	---	---	24.5
Excess Air to Burners	%	15.0	15.0	15.7
AH Leakage	MLB/HR	484	---	390
Moisture In Air	LB/LB DA	.0067	.0067	.0071
Dry Gas Wt Lvg Econ	LB/LB Fuel	---	9.997	11.082
Dry Air Wt to Burners	LB/LB Fuel	---	9.469	10.502
Wet Gas Wt Lvg Econ	LB/LB Fuel	---	10.552	11.680
Losses	%			
Dry Gas		4.84	5.12	5.20
H2O in Fuel	(2)	5.15	.88	.75
H2 in Fuel		---	4.30	4.32
Moisture in Air		.07	.06	.07
Unburned Combustible		.20	.12	.12
Radiation		.17	.17	.16
Unaccounted	(3)	1.00	.50	.50
Summation of Losses		11.43	11.15	11.12
Efficiency	%	88.57	88.85	88.88
Unit Output	MKB	6691.5	6691.5	6818.1
Fuel Input	MKB	7555.0	7531.2	7671.1
Fuel Rate	MLB/HR	686.2	684.0	642.6

(1) Includes By-Pass Flow (2) Includes H2 in Fuel Loss

(3) Includes Manufacturer's Margin of .5 %

TEST 4A : 21Sep88 : 1045-1435 : 850 MW F MILL OUT FINAL COMPOSITE AH JDR-110488

TEST 5A : 22Sep88 : 1005-1415 : 847 MW H MILL OUT FINAL CALCULATION JDR-110488

CALCULATED SECONDARY AH GAS OUTLET CONDITIONS

		LVG ECON	ENT PRI	LVG PRI	ENT SEC	LVG SEC	TOTAL LVG AH'S
O2,	%	3.08*	3.09*	6.06*	3.08*	3.74	4.06*
CO2,	%	15.72	15.71	13.09	15.72	15.13	14.86
EXCESS AIR,	%	16.8	16.9	39.6	16.8	21.2	23.4
H2O IN GAS,	%	5.28	5.28	4.59	5.28	5.13	5.06
T AIR,	F		85.6*	519.4*	64.0*	629.1*	
H AIR,	BTU/LB			1.4	-3.9		
T AIR CALC,	F			519.8		635.5	
T GAS,	F	722.9*	709.7*	301.2*	722.9*	283.6	286.0*
H GAS,	BTU/LB			55.0		50.8	51.4
H GASC,	BTU/LB			64.7		52.7	54.2
T GAS (W/O LKG), F				337.7		290.8	296.5
WT AIR,	KLB/HR			811.2		5196.0	0.0
WT GAS,	KLB/HR	7338.0	882.8	1041.1	6455.2	6678.1	7719.2
AH LKG,	KLB/HR			158.4*		222.9	381.2*

\* DENOTES MEASURED VALUES.

PRI AH AIR BY-PASS FLOW = 620.8  
 MOIS IN AIR, LB/LB DA = .0075  
 WT AIR LVG SEC BY HT BAL = 5256.4

		CONTRACT SUMMARY SHEET	TEST 5A CORRECTED FOR CONTR. CONDITIONS	TEST 5A WITH TEST CONDITIONS
Fuel				
Air Temp Ent AH	PRI/SEC F	77/ 64	77/ 64	86/ 64
Air Temp Lvg AH	PRI/SEC F	582/ 647	0/ 0	519/ 629
Air Flow Lvg AH (1)	PRI/SEC MLB/HR	1335/5184	1432/5077	1432/5196
AH Air By-Pass Flow	MLB/HR	497.8	620.8	620.8
Mill Inlet Temp	F	397.2	0.0	333.2
Ave Air Temp Ent AH	F	66.7	66.9	68.7
Gas Temp Lvg Econ	F	736.0	722.9	722.9
Gas Flow Ent AH	MLB/HR	7210	7204	7338
Ave Gas Temp Lvg AH (Incl Lkg)	F	281.6	---	286.0
Ave Gas Temp Lvg AH (Excl Lkg)	F	294.7	295.4	296.6
Excess Air Lvg Econ	%	17.0	17.0	16.8
Excess Air Lvg AH	%	---	---	23.4
Excess Air to Burners	%	15.0	15.0	14.7
AH Leakage	MLB/HR	484	---	381
Moisture In Air	LB/LB DA	.0067	.0067	.0075
Dry Gas Wt Lvg Econ	LB/LB Fuel	---	10.004	10.838
Dry Air Wt to Burners	LB/LB Fuel	---	9.476	10.258
Wet Gas Wt Lvg Econ	LB/LB Fuel	---	10.559	11.442
Losses	%			
Dry Gas		4.84	4.98	5.01
H2O in Fuel	(2)	5.15	.87	.85
H2 in Fuel		---	4.29	4.29
Moisture in Air		.07	.06	.07
Unburned Combustible		.20	.05	.05
Radiation		.17	.17	.16
Unaccounted	(3)	1.00	.50	.50
Summation of Losses		11.43	10.92	10.93
Efficiency	%	88.57	89.08	89.07
Unit Output	MKB	6691.5	6691.5	6763.2
Fuel Input	MKB	7555.0	7511.8	7593.1
Fuel Rate	MLB/HR	686.2	682.3	641.3

(1) Includes By-Pass Flow (2) Includes H2 in Fuel Loss  
 (3) Includes Manufacturer's Margin of .5 %

TEST 5A : 22Sep88 : 1005-1415 : 847 MW H MILL OUT FINAL COMPOSITE AH JDR-110488

TEST 6A : 23Sep88 : 1025-1435 : 849 MW G MILL OUT FINAL CALCULATION JDR-110488

CALCULATED SECONDARY AH GAS OUTLET CONDITIONS

	LVG ECON	ENT PRI	LVG PRI	ENT SEC	LVG SEC	TOTAL LVG AH'S	
O2,	%	3.01*	2.91*	6.13*	3.01*	3.69	4.02*
CO2,	%	15.85	15.94	13.09	15.85	15.25	14.96
EXCESS AIR,	%	16.3	15.7	40.3	16.3	20.8	23.2
H2O IN GAS,	%	5.19	5.21	4.46	5.19	5.03	4.95
T AIR,	F		93.3*	522.7*	71.4*	634.9*	
H AIR,	BTU/LB		3.2		-2.1		
T AIR CALC,	F			523.1		644.1	
T GAS,	F	728.4*	713.8*	302.4*	728.4*	293.1	294.3*
H GAS,	BTU/LB			55.3		53.2	53.5
H GASC,	BTU/LB			65.5		55.1	56.3
T GAS (W/O LKG), F				341.0		300.5	305.2
WT AIR,	KLB/HR			778.4		5138.0	0.0
WT GAS,	KLB/HR	7293.0	836.5	1000.0	6456.5	6685.7	7685.7
AH LKG,	KLB/HR			163.5*		229.2	392.7*

\* DENOTES MEASURED VALUES.

PRI AH AIR BY-PASS FLOW =	662.4
MOIS IN AIR, LB/LB DA =	.0065
WT AIR LVG SEC BY HT BAL =	5224.5

		CONTRACT SUMMARY SHEET	TEST 6A CORRECTED FOR CONTR. CONDITIONS	TEST 6A WITH TEST CONDITIONS
Fuel			CONTRACT	TEST
Air Temp Ent AH	PRI/SEC F	77/ 64	77/ 64	93/ 71
Air Temp Lvg AH	PRI/SEC F	582/ 647	0/ 0	523/ 635
Air Flow Lvg AH (1)	PRI/SEC MLB/HR	1335/5184	1441/5075	1441/5138
AH Air By-Pass Flow	MLB/HR	497.8	662.4	662.4
Mill Inlet Temp	F	397.2	0.0	327.1
Ave Air Temp Ent AH	F	66.7	66.9	76.2
Gas Temp Lvg Econ	F	736.0	728.4	728.4
Gas Flow Ent AH	MLB/HR	7210	7212	7293
Ave Gas Temp Lvg AH (Incl Lkg)	F	281.6	---	294.3
Ave Gas Temp Lvg AH (Excl Lkg)	F	294.7	299.3	305.3
Excess Air Lvg Econ	%	17.0	17.0	16.3
Excess Air Lvg AH	%	---	---	23.2
Excess Air to Burners	%	15.0	15.0	14.2
AH Leakage	MLB/HR	484	---	393
Moisture In Air	LB/LB DA	.0067	.0067	.0065
Dry Gas Wt Lvg Econ	LB/LB Fuel	---	10.005	10.728
Dry Air Wt to Burners	LB/LB Fuel	---	9.477	10.140
Wet Gas Wt Lvg Econ	LB/LB Fuel	---	10.561	11.315
Losses %				
Dry Gas		4.84	5.07	5.01
H2O in Fuel	(2)	5.15	.87	.88
H2 in Fuel		---	4.30	4.21
Moisture in Air		.07	.06	.06
Unburned Combustible		.20	.04	.04
Radiation		.17	.17	.16
Unaccounted	(3)	1.00	.50	.50
Summation of Losses		11.43	11.01	10.86
Efficiency %		88.57	88.99	89.14
Unit Output	MKB	6691.5	6691.5	6766.8
Fuel Input	MKB	7555.0	7519.4	7591.2
Fuel Rate	MLB/HR	686.2	683.0	644.6

(1) Includes By-Pass Flow (2) Includes H2 in Fuel Loss

(3) Includes Manufacturer's Margin of .5 %

TEST 6A : 23Sep88 : 1025-1435 : 849 MW G MILL OUT FINAL COMPOSITE AH JDR-110488

TEST 7A1 : 26Sep88 : 2355-0040 : 433 MW 50% LOAD FINAL CALCULATION JDR-110488

CALCULATED SECONDARY AH GAS OUTLET CONDITIONS

		LVG ECON	ENT PRI	LVG PRI	ENT SEC	LVG SEC	TOTAL LVG AH'S
O2,	%	6.59*	6.70*	8.62*	6.59*	7.57	7.68*
CO2,	%	12.54	12.45	10.76	12.54	11.69	11.59
EXCESS AIR,	%	44.7	45.7	68.1	44.7	55.1	56.3
H2O IN GAS,	%	4.33	4.30	3.83	4.33	4.09	4.06
T AIR,	F		99.5*	507.3*	70.9*	574.7*	
H AIR,	BTU/LB		4.7		-2.2		
T AIR CALC.,	F			507.7		569.3	
T GAS,	F	654.8*	647.2*	296.1*	654.8*	251.1	256.3*
H GAS,	BTU/LB			53.4		42.2	43.5
H GASC,	BTU/LB			60.4		45.2	46.8
T GAS (W/O LKG), F				323.0		262.5	269.1
WT AIR,	KLB/HR			436.7		3531.0	0.0
WT GAS,	KLB/HR	4777.0	518.8	593.4	4258.2	4542.2	5135.6
AH LKG,	KLB/HR			74.6*		284.0	358.6*

\* DENOTES MEASURED VALUES.

PRI AH AIR BY-PASS FLOW = 374.8  
 MOIS IN AIR, LB/LB DA = .0052  
 WT AIR LVG SEC BY HT BAL = 3492.3

			TEST 7A1 CORRECTED FOR CONTR. SHEET	TEST 7A1 WITH TEST CONDITIONS
Fuel			CONTRACT	TEST
Air Temp Ent AH	PRI/SEC	F	77/ 64	100/ 71
Air Temp Lvg AH	PRI/SEC	F	582/ 647	507/ 575
Air Flow Lvg AH (1)	PRI/SEC	MLB/HR	1335/5184	812/5642
AH Air By-Pass Flow		MLB/HR	497.8	374.8
Mill Inlet Temp		F	397.2	320.7
Ave Air Temp Ent AH		F	66.7	76.3
Gas Temp Lvg Econ		F	736.0	654.8
Gas Flow Ent AH		MLB/HR	7210	7143
Ave Gas Temp Lvg AH (Incl Lkg)		F	281.6	---
Ave Gas Temp Lvg AH (Excl Lkg)		F	294.7	261.8
Excess Air Lvg Econ		%	17.0	44.7
Excess Air Lvg AH		%	---	56.3
Excess Air to Burners		%	15.0	40.8
AH Leakage		MLB/HR	484	---
Moisture In Air		LB/LB DA	.0067	.0052
Dry Gas Wt Lvg Econ		LB/LB Fuel	---	13.335
Dry Air Wt to Burners		LB/LB Fuel	---	12.605
Wet Gas Wt Lvg Econ		LB/LB Fuel	---	13.937
Losses		%		
Dry Gas			4.84	5.20
H2O in Fuel		(2)	5.15	.84
H2 in Fuel			---	4.30
Moisture in Air			.07	.05
Unburned Combustible			.20	.08
Radiation			.17	.30
Unaccounted		(3)	1.00	.50
Summation of Losses			11.43	11.27
Efficiency		%	88.57	88.73
Unit Output		MKB	6691.5	3603.3
Fuel Input		MKB	7555.0	4061.0
Fuel Rate		MLB/HR	686.2	342.7

(1) Includes By-Pass Flow (2) Includes H2 in Fuel Loss

(3) Includes Manufacturer's Margin of .5 %

TEST 7A1 : 26Sep88 : 2355-0040 : 433 MW 50% LOAD FINAL COMPOSITE AH JDR-110488

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TEST 7A2 : 26Sep88 : 0240-0355 : 435 MW 50% LOAD AFTER SOOTBLOWING RH JDR-110488

CALCULATED SECONDARY AH GAS OUTLET CONDITIONS

	LVG ECON	ENT PRI	LVG PRI	ENT SEC	LVG SEC	TOTAL LVG AH'S
O2,	%	5.82*	5.91*	9.16*	5.82*	6.78
CO2,	%	13.22	13.14	10.29	13.22	12.38
EXCESS AIR,	%	37.5	38.3	75.7	37.5	46.6
H2O IN GAS,	%	4.51	4.49	3.69	4.51	4.29
T AIR,	F		99.0*	499.2*	70.6*	560.4*
H AIR,	BTU/LB		4.6		-2.3	
T AIR CALC,	F			499.9		563.9
T GAS,	F	640.5*	632.2*	296.9*	640.5*	240.9
H GAS,	BTU/LB			53.5		39.8
H GAS C,	BTU/LB			65.9		42.3
T GAS (W/O LKG), F				344.3		250.9
WT AIR,	KLB/HR			439.6		3271.0
WT GAS,	KLB/HR	4507.0	576.4	722.1	3930.6	4172.2
AH LKG,	KLB/HR			145.7*		241.6
						4894.3
						387.3*

\* DENOTES MEASURED VALUES.

PRI AH AIR BY-PASS FLOW = 366.8  
MOIS IN AIR, LB/LB DA = .0052  
WT AIR LVG SEC BY HT BAL = 3294.9

			TEST 7A2 CORRECTED FOR CONTR. SHEET	TEST 7A2 WITH TEST CONDITIONS
Fuel			CONTRACT	TEST
Air Temp Ent AH	PRI/SEC	F	77/ 64	99/ 71
Air Temp Lvg AH	PRI/SEC	F	582/ 647	0/ 0
Air Flow Lvg AH (1)	PRI/SEC	MLB/HR	1335/5184	806/5637
AH Air By-Pass Flow		MLB/HR	497.8	366.8
Mill Inlet Temp		F	397.2	0.0
Ave Air Temp Ent AH		F	66.7	65.6
Gas Temp Lvg Econ		F	736.0	640.5
Gas Flow Ent AH		MLB/HR	7210	7132
Ave Gas Temp Lvg AH (Incl Lkg)		F	281.6	---
Ave Gas Temp Lvg AH (Excl Lkg)		F	294.7	255.9
Excess Air Lvg Econ		%	17.0	17.0
Excess Air Lvg AH		%	---	---
Excess Air to Burners		%	15.0	15.0
AH Leakage		MLB/HR	484	---
Moisture In Air		LB/LB DA	.0067	.0052
Dry Gas Wt Lvg Econ		LB/LB Fuel	---	10.001
Dry Air Wt to Burners		LB/LB Fuel	---	9.473
Wet Gas Wt Lvg Econ		LB/LB Fuel	---	10.556
Losses		%		
Dry Gas			4.84	4.80
H2O in Fuel		(2)	5.15	.84
H2 in Fuel			---	4.23
Moisture in Air			.07	.05
Unburned Combustible			.20	.08
Radiation			.17	.30
Unaccounted		(3)	1.00	.50
Summation of Losses			11.43	10.04
Efficiency		%	88.57	89.96
Unit Output		MKB	6691.5	3583.7
Fuel Input		MKB	7555.0	4020.3
Fuel Rate		MLB/HR	686.2	339.3

(1) Includes By-Pass Flow (2) Includes H2 in Fuel Loss

(3) Includes Manufacturer's Margin of .5 %

TEST 7A2 : 26Sep88 : 0240-0355 : 435 MW 50% LOAD AFTER SOOTBLOWING RH JDR-110488

TEST 8A : 26Sep88 : 0515-0715 : 646 MW 75% LOAD FINAL CALCULATION JDR-110788

CALCULATED SECONDARY AH GAS OUTLET CONDITIONS

		LVG ECON	ENT PRI	LVG PRI	ENT SEC	LVG SEC	TOTAL LVG AH'S
O2,	%	3.62*	3.89*	7.21*	3.62*	4.58	4.90*
CO2,	%	15.12	14.89	11.98	15.12	14.28	14.00
EXCESS AIR,	%	20.3	22.2	51.1	20.3	27.2	29.7
H2O IN GAS,	%	5.18	5.11	4.32	5.18	4.96	4.87
T AIR,	F		93.9*	523.7*	69.0*	603.7*	
H AIR,	BTU/LB		3.4		-2.7		
T AIR CALC,	F			524.2		616.4	
T GAS,	F	697.5*	684.8*	306.3*	697.5*	268.0	273.1*
H GAS,	BTU/LB			56.2		46.8	48.1
H GASC,	BTU/LB			67.8		49.4	51.6
T GAS (W/O LKG), F				350.3		277.9	286.5
WT AIR,	KLB/HR			562.9		4113.0	0.0
WT GAS,	KLB/HR	5728.0	676.4	824.7	5051.6	5317.5	6142.2
AH LKG,	KLB/HR			148.2*		266.0	414.2*

\* DENOTES MEASURED VALUES.

PRI AH AIR BY-PASS FLOW =	489.5
MOIS IN AIR, LB/LB DA =	.0067
WT AIR LVG SEC BY HT BAL =	4213.4

		CONTRACT SUMMARY SHEET	TEST 8A CORRECTED FOR CONTR. CONDITIONS	TEST 8A WITH TEST CONDITIONS
Fuel			CONTRACT	TEST
Air Temp Ent AH	PRI/SEC	F	77/ 64	94/ 69
Air Temp Lvg AH	PRI/SEC	F	582/ 647	524/ 604
Air Flow Lvg AH (1)	PRI/SEC	MLB/HR	1335/5184	1052/5434
AH Air By-Pass Flow		MLB/HR	497.8	489.5
Mill Inlet Temp		F	397.2	325.6
Ave Air Temp Ent AH		F	66.7	74.1
Gas Temp Lvg Econ		F	736.0	697.5
Gas Flow Ent AH		MLB/HR	7210	7180
Ave Gas Temp Lvg AH (Incl Lkg)		F	281.6	273.1
Ave Gas Temp Lvg AH (Excl Lkg)		F	294.7	286.6
Excess Air Lvg Econ		%	17.0	20.3
Excess Air Lvg AH		%	---	29.7
Excess Air to Burners		%	15.0	17.6
AH Leakage		MLB/HR	484	414
Moisture In Air		LB/LB DA	.0067	.0067
Dry Gas Wt Lvg Econ		LB/LB Fuel	---	10.002
Dry Air Wt to Burners		LB/LB Fuel	---	9.474
Wet Gas Wt Lvg Econ		LB/LB Fuel	---	10.557
Losses		%		
Dry Gas			4.84	4.81
H2O in Fuel		(2)	5.15	.81
H2 in Fuel			---	4.39
Moisture in Air			.07	.06
Unburned Combustible			.20	.07
Radiation			.17	.21
Unaccounted		(3)	1.00	.50
Summation of Losses			11.43	10.85
Efficiency		%	88.57	89.37
Unit Output		MKB	6691.5	5139.8
Fuel Input		MKB	7555.0	5765.3
Fuel Rate		MLB/HR	686.2	482.0

(1) Includes By-Pass Flow (2) Includes H2 in Fuel Loss

(3) Includes Manufacturer's Margin of .5 %

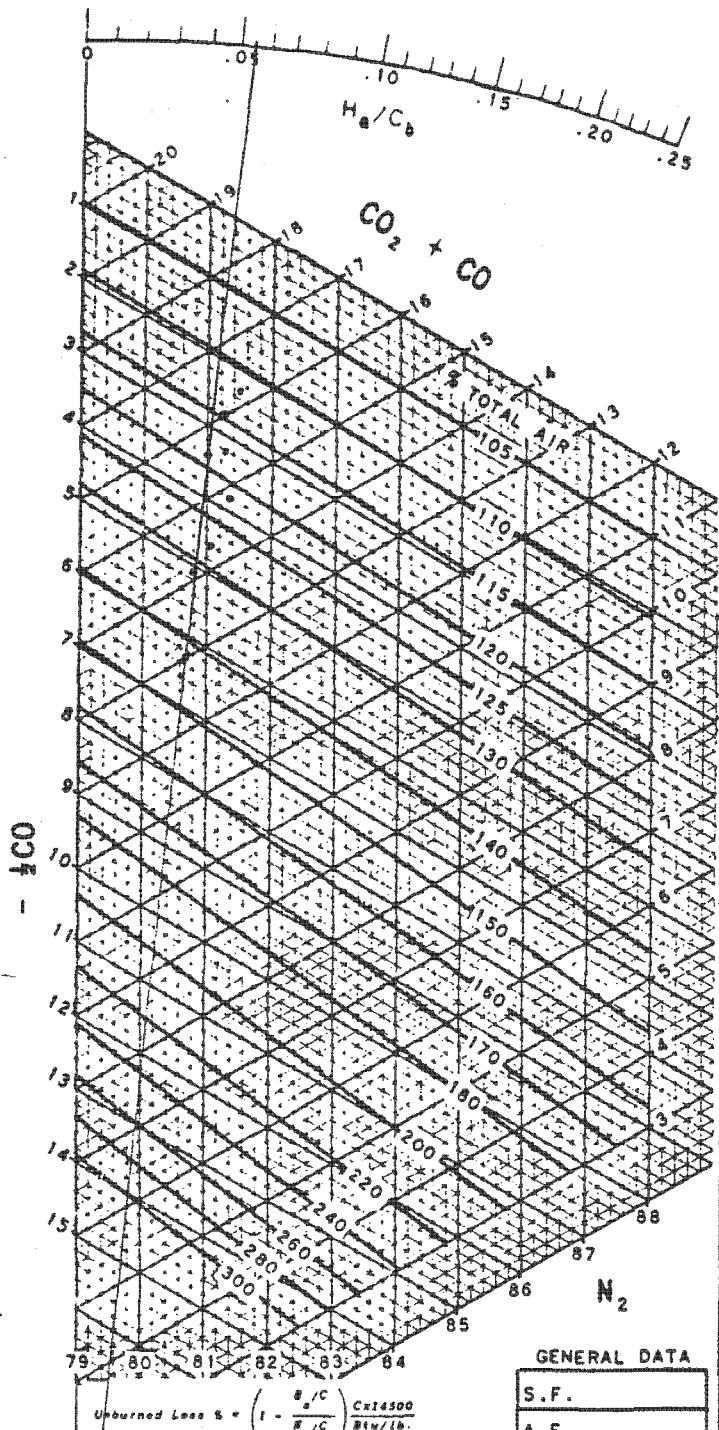
TEST 8A : 26Sep88 : 0515-0715 : 646 MW 75% LOAD FINAL COMPOSITE AH JDR-110788

IP14\_000778

**IP14\_000779**

APPENDIX 9  
ORSAT VERSUS ANALYZER COMPARISON

IP14\_000780



$$\text{Unburned Loss} = \left(1 - \frac{R_a}{R_b}\right) \frac{C \times 14500}{\text{BTU/lb.}}$$

Where:

$$\frac{R_a}{R_b}$$
 is from gas analysis

$$\frac{R_b}{C}$$
 Stu/lb. is from coal analysis

Note: For complete uniform combustion, all points should lie along straight line drawn through pivot point.

SUBJECT TEST 2A

FILE NO.

BY JDR

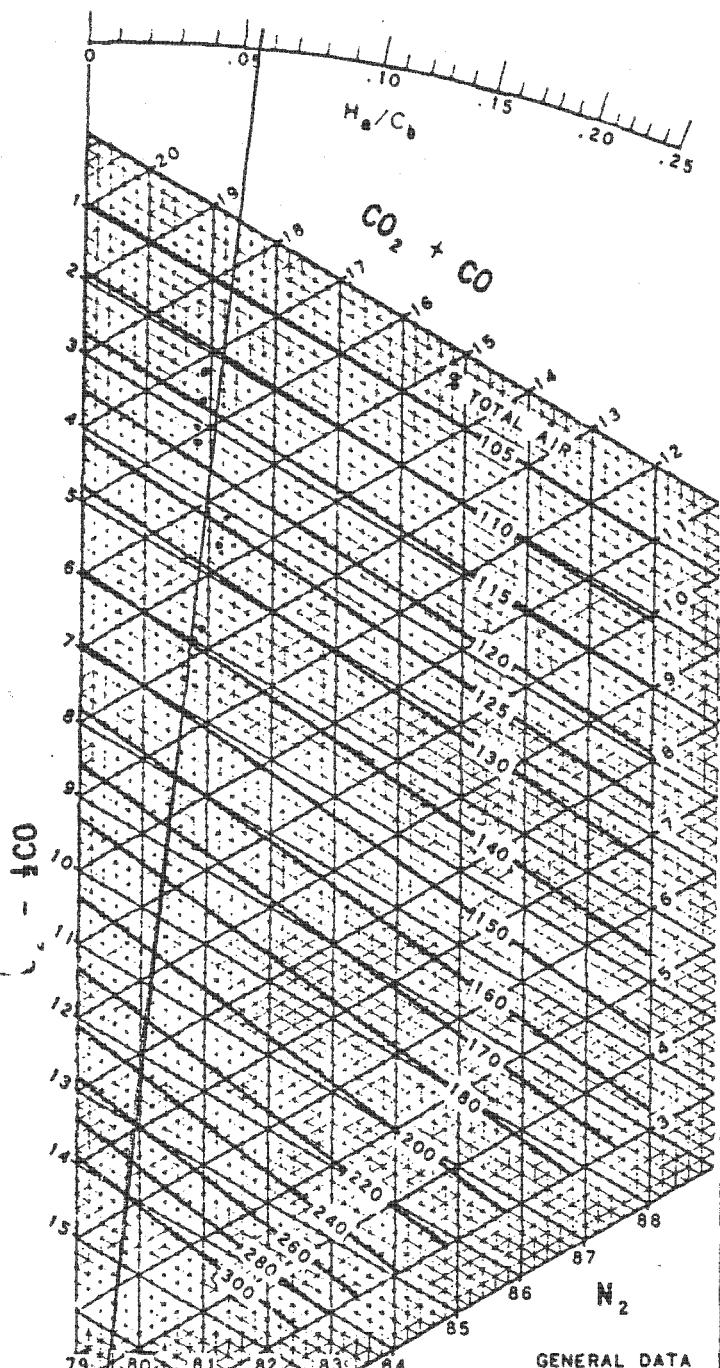
DATE 10-3-88

REV.

THE BABCOCK & WILCOX CO.  
RESEARCH LABORATORY  
ALLIANCE, OHIO

DRAWING NO.

TIME	LOCATION	CO <sub>2</sub>	+ O <sub>2</sub>	+ CO	- O <sub>2</sub>	CO	% UNBURNED	% T.A.
EAST ECON								
	ORSAT	15.5	3.2					
	ANALYZER		3.47					
WEST ECON								
	ORSAT	16.2	2.3					
	ANALYZER		2.54					
EAST PRE AL IN								
	ORSAT	15.6	3.4					
	ANALYZER		3.42					
WEST PRE A- IN								
	ORSAT	16.6	2.7					
	ANALYZER		2.61					
EAST PRE A- OUT								
	ORSAT	13.0	6.3					
	ANALYZER		6.14					
WEST PRE A- OUT								
	ORSAT	14.1	5.1					
	ANALYZER		5.84					
EAST BACKUP								
	ORSAT	14.3	4.6					
	ANALYZER		4.34					
WEST CASHOULE								
	ORSAT	14.8	3.8					
	ANALYZER		3.6					



$$\text{Unburned Loss \%} = \left( 1 - \frac{B_e/C}{B_{e0}/C_0} \right) \frac{CH14500}{B_e u/\text{lb.}}$$

100

$\frac{S}{C}$  is from gas analysis

For complete uniform combustion.  $\Delta$

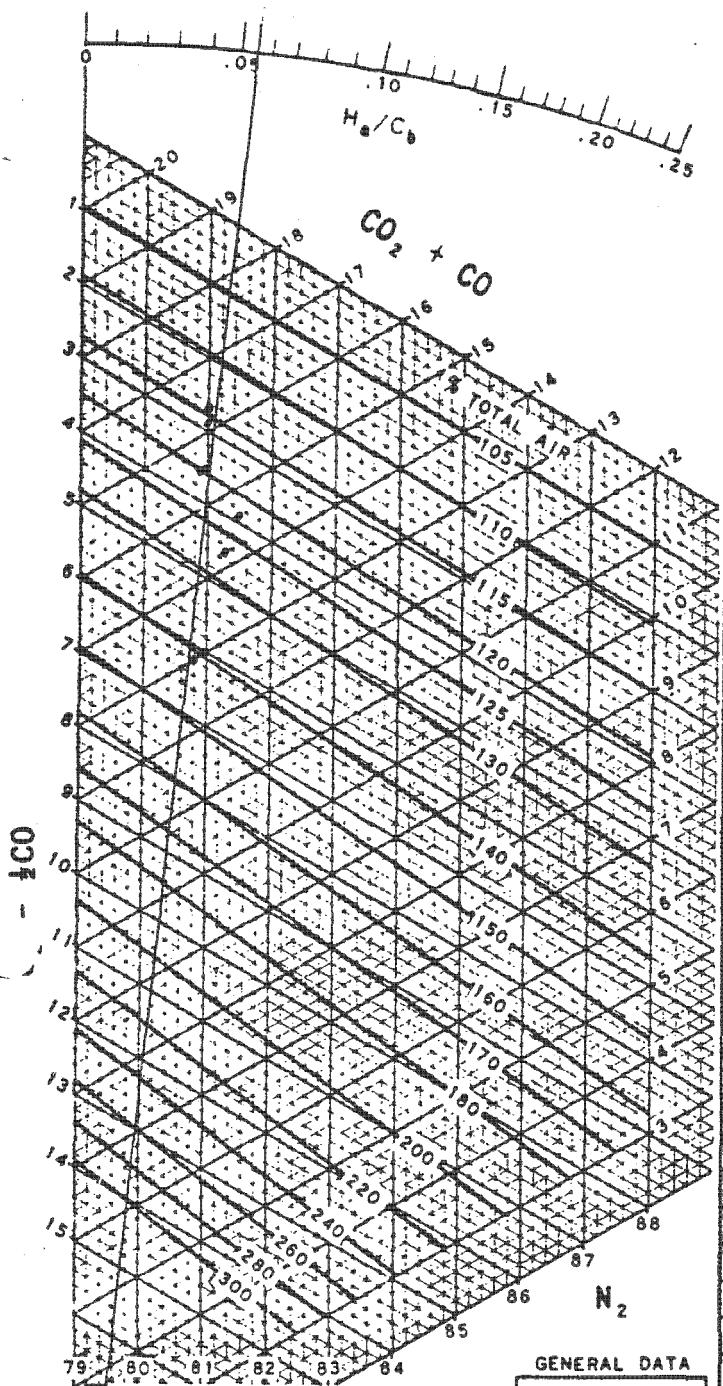
**Note** For complete uniform combustion, all points should lie along straight line drawn through pivot point.

GENERAL DATA	
S.F.	
A.F.	
FUEL ANALYSIS	
H	
O	
C	
BTU/LB	
H <sub>2</sub> /C	

SUBJECT TEST 3A

TIME	LOCATION	CO <sub>2</sub>	+ O <sub>2</sub>	+ CO	O <sub>2</sub>	CO	% UN-BURNED	% T.A.
EAST	ECON							
	ORCAT	15.9	3.3					
	ANALYZER		3.39					
WEST	ECON							
	ORCAT	16.4	2.7					
	ANALYZER		2.79					
EAST	DRI AF IN							
	ORCAT	16.1	3.1					
	ANALYZER		2.93					
WEST	PRE AF IN							
	ORCAT	16.8	2.3					
	ANALYZER		2.12					
EAST	PRE AF OUT							
	ORCAT	13.2	6.0					
	ANALYZER		6.50					
WEST	PRE AF OUT							
	ORCAT	13.3	5.8					
	ANALYZER		5.95					
EAST	SAC 200 F							
	ORCAT	14.3	4.5					
	ANALYZER		4.51					
WEST	SAC 200 E							
	ORCAT	14.6	4.1					
	ANALYZER		3.98					

THE BABCOCK & WILCOX CO.  
RESEARCH LABORATORY  
ALLIANCE, OHIO



$$\text{Unburned Loss \%} = \left( 1 - \frac{\frac{B}{a} / C}{\frac{B}{a} / C_b} \right) \frac{C x 14500}{B \text{lb./lb.}}$$

340

$\frac{S}{C}$  as from gas analysis

$\frac{S}{C} \text{ Stu/lb. is from coal analysis}$

**Note** For complete uniform combustion, all points should lie along straight lines drawn through point pairs.

## GENERAL DATA

S. F.

A, F.

## FUEL ANALYSIS

H

8

6

BYU LIBRARIES

H-16

SUBJECT TEST NO.

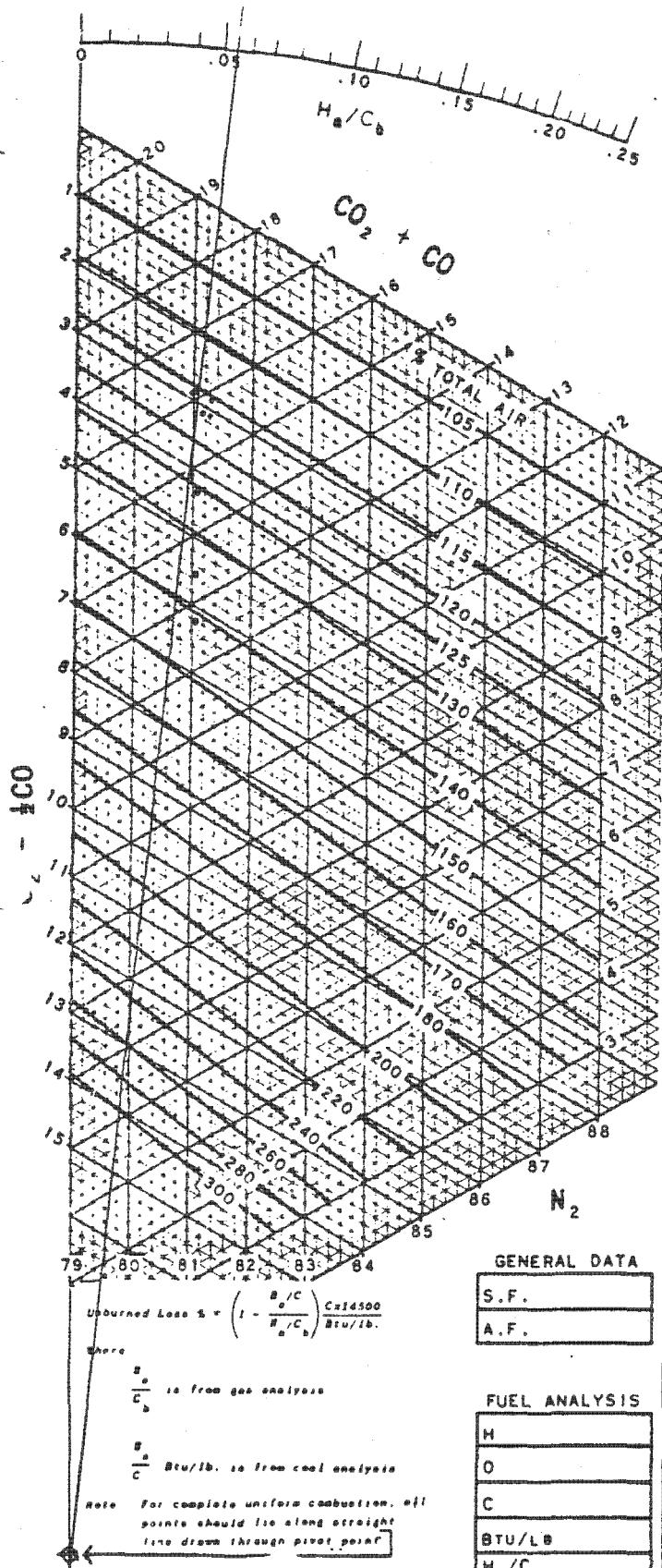
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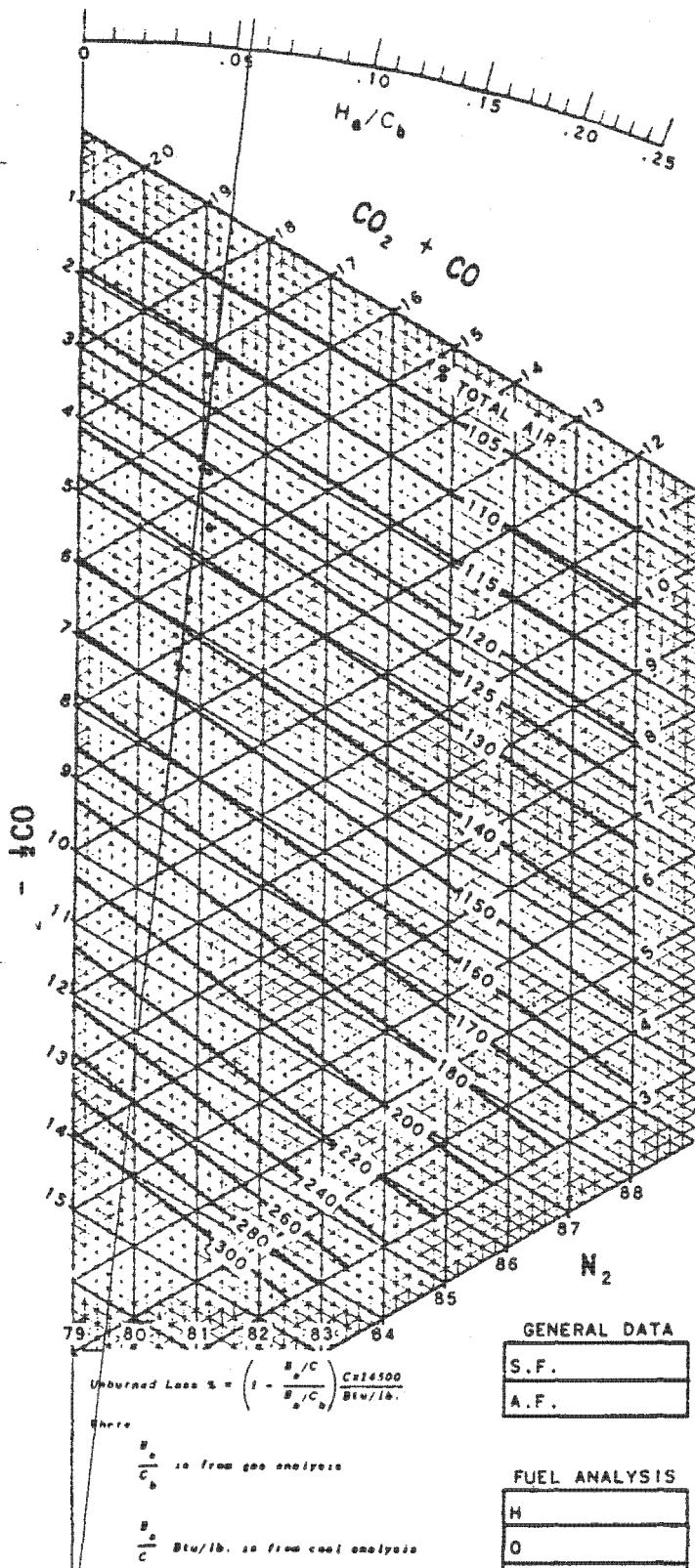
BY T.D.

**DATE** 10-3-88

REV.

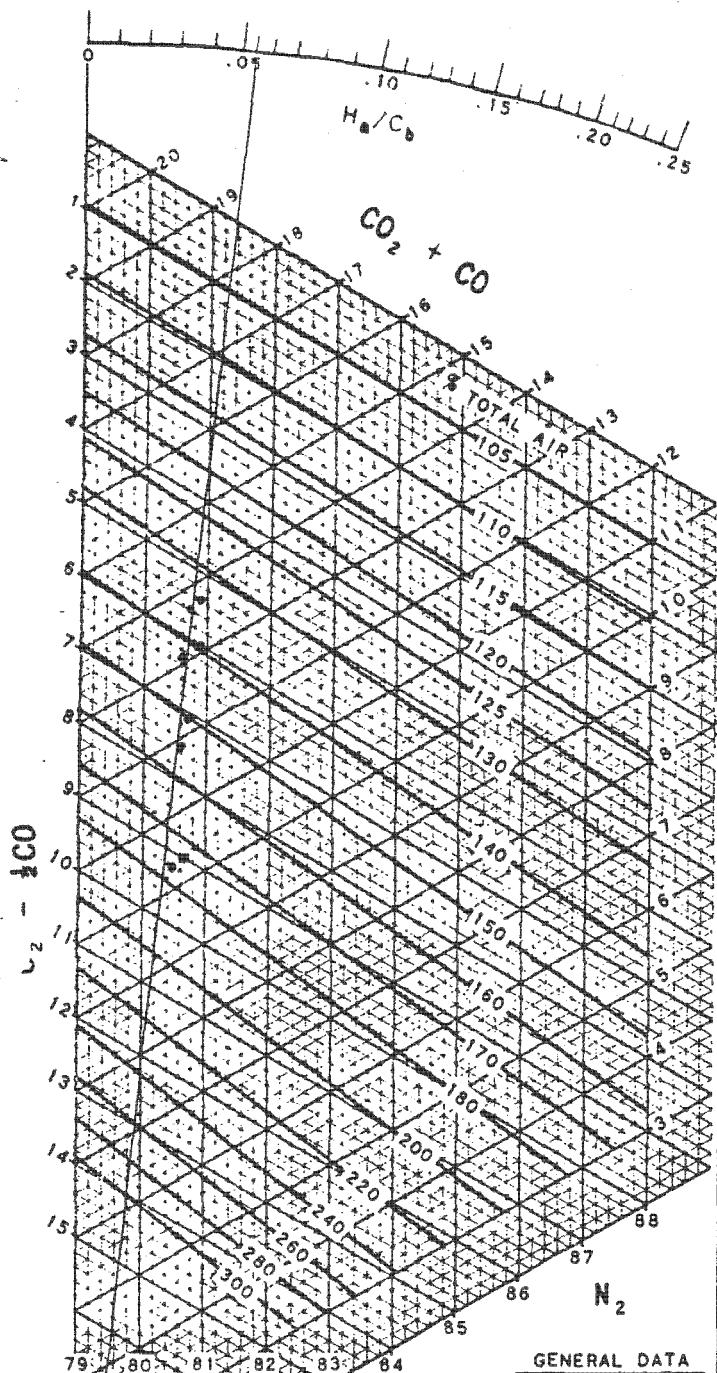
THE BABCOCK & WILCOX CO.  
RESEARCH LABORATORY  
ALLIANCE, OHIO





TIME	LOCATION	CO <sub>2</sub>	+ O <sub>2</sub>	+ CO	O <sub>2</sub>	CO	% UN-BURNED	% T.A.
EAST	ECON							
	ORCAT	15.5	3.6					
	ANALYZER		3.67					
WEST	ECON							
	ORCAT	16.65	2.36					
	ANALYZER		2.34					
EAST	PRI AF IN							
	ORCAT	15.3	3.7					
	ANALYZER		3.78					
WEST	PRI AF IN							
	ORCAT	16.7	2.0					
	ANALYZER		2.03					
EAST	PRI F-20							
	ORCAT	12.7	6.6					
	ANALYZER		6.48					
WEST	PRI F-20							
	ORCAT	13.6	5.6					
	ANALYZER		5.77					
EAST	BACKUP							
	ORCAT	14.46	4.6					
	ANALYZER		4.49					
WEST	BACKUP							
	ORCAT	15.2	3.7					
	ANALYZER		3.54					

SUBJECT	TEST 6A	FILE NO.	THE BABCOCK & WILCOX CO.
		BY JDR	RESEARCH LABORATORY
		DATE 10-3-88	ALLIANCE, OHIO
		REV.	DRAWING NO.



## GENERAL DATA

S.F.
A.F.

$$\text{Unburned Loss } \delta = \left( 1 - \frac{H_a}{H_a/C_b} \right) \frac{C_a \times 14500}{\text{BTU/lb.}}$$

where:

$$\frac{H_a}{C_b}$$
 is from gas analysis

$$\frac{H_a}{C_b}$$
 BTU/lb. is from coal analysis

Note: For complete uniform combustion, all points should lie along straight line drawn through pivot point

## FUEL ANALYSIS

H
O
C
BTU/LB
H <sub>a</sub> /C <sub>b</sub>

SUBJECT TEST 7A

FILE NO.

BY JDR

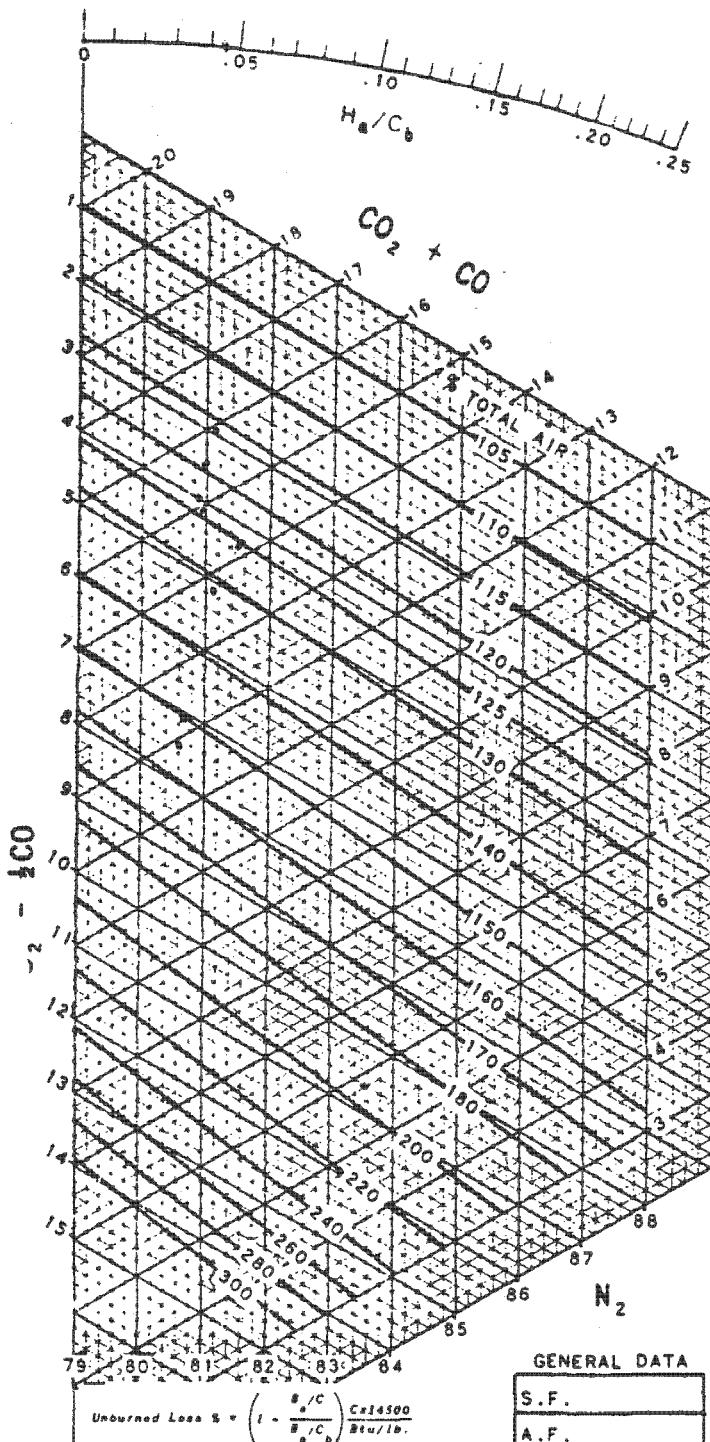
DATE 9-30-88

REV.

THE BABCOCK & WILCOX CO.  
RESEARCH LABORATORY  
ALLIANCE, OHIO

DRAWING NO.

TIME	LOCATION	CO <sub>2</sub>	+ O <sub>2</sub>	+ CO	O <sub>2</sub>	CO	% UNBURNED	% T.A.
	ECON EAST							
	ORSAT	13.1	6.0					
	ANALYZER		6.18					
	ECON WEST							
	ORSAT	13.75	5.4					
	ANALYZER		5.53					
	EAST PRI AH IN							
	ORSAT	13.1	6.3					
	ANALYZER		6.2					
	WEST PRI AH IN							
	ORSAT	13.7	5.62					
	ANALYZER		5.65					
	EAST PRI AH OUT							
	ORSAT	10.3	9.0					
	ANALYZER		9.0					
	WEST PRI AH OUT							
	ORSAT	10.3	9.2					
	ANALYZER		9.43					
	EAST BAGHOUSE IN							
	ORSAT	11.9	7.5					
	ANALYZER		7.4					
	WEST BAGHOUSE IN							
	ORSAT	12.2	7.1					
	ANALYZER		6.9					

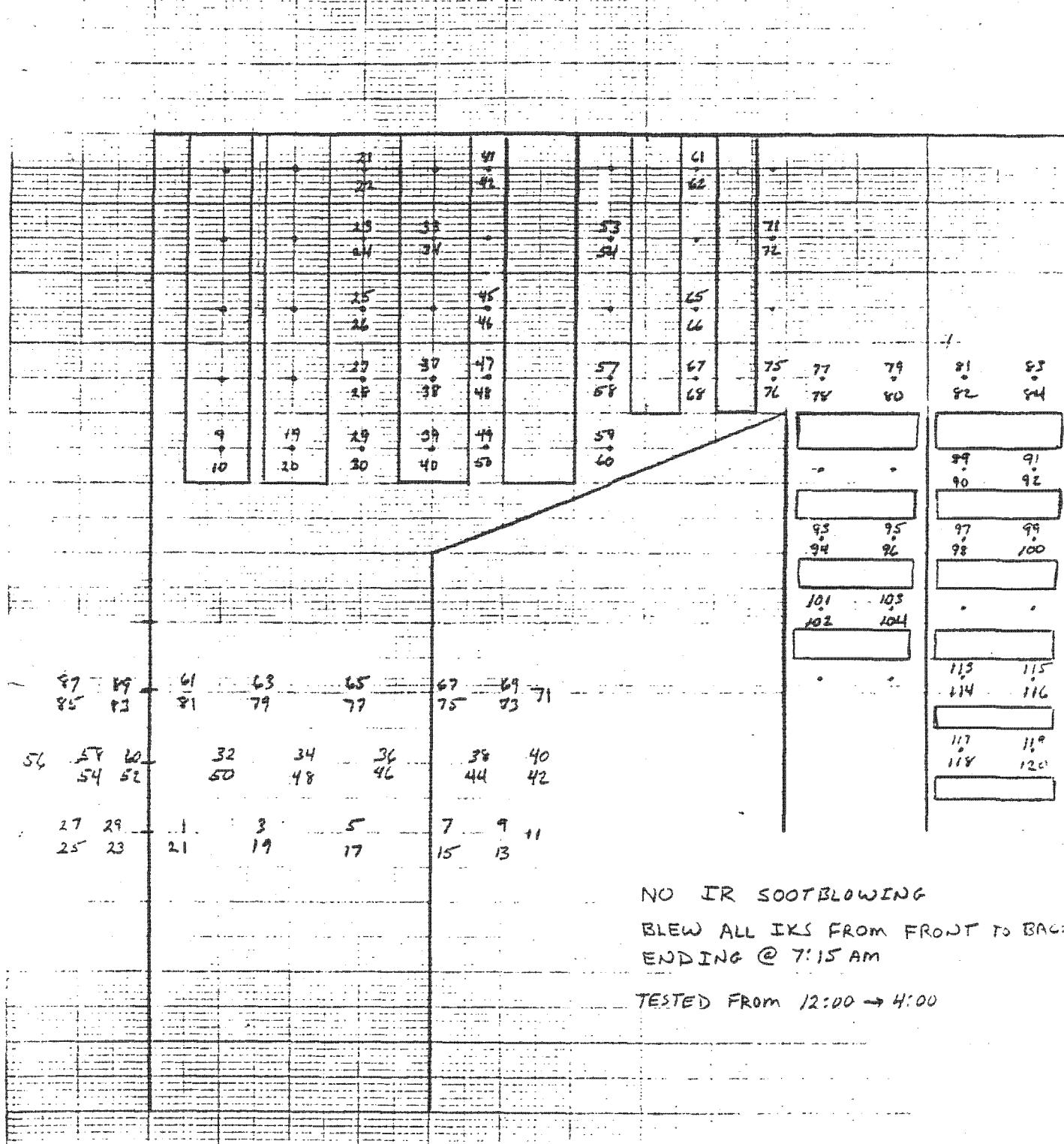


TIME	LOCATION	CO <sub>2</sub>	+O <sub>2</sub>	+CO	-O <sub>2</sub>	-CO	% UNBURNED	% T.A.
EAST	ECON							
	ORIFAT	15.1	4.0					
	ANALYZER		4.07					
WEST	ECON							
	ORIFAT	15.9	2.93					
	ANALYZER		3.16					
EAST	PRE-A-FIN							
	ORIFAT	14.9	4.12					
	ANALYZER		4.28					
WEST	PRE-A-FIN							
	ORIFAT	15.5	3.45					
	ANALYZER		3.49					
EAST	PRE-A-FIN							
	ORIFAT	12.2	7.1					
	ANALYZER		7.17					
WEST	PRE-A-FIN							
	ORIFAT	11.9	7.45					
	ANALYZER		7.24					
EAST	PRE-O-FIN							
	ORIFAT	13.7	5.07					
	ANALYZER		5.20					
WEST	PRE-O-FIN							
	ORIFAT	14.1	4.35					
	ANALYZER		4.6					
SUBJECT	TEST 2A	FILE NO.	THE BABCOCK & WILCOX CO. RESEARCH LABORATORY ALLIANCE, OHIO					
BY								
DATE								
REV.		DRAWING NO.						

**IP14\_000788**

**APPENDIX 10**  
**SOOTBLOWING SUMMARY**

**THE BABCOCK & WILCOX COMPANY**



IPP RB 615  
SOOTBLUNER ARRANGEMENT

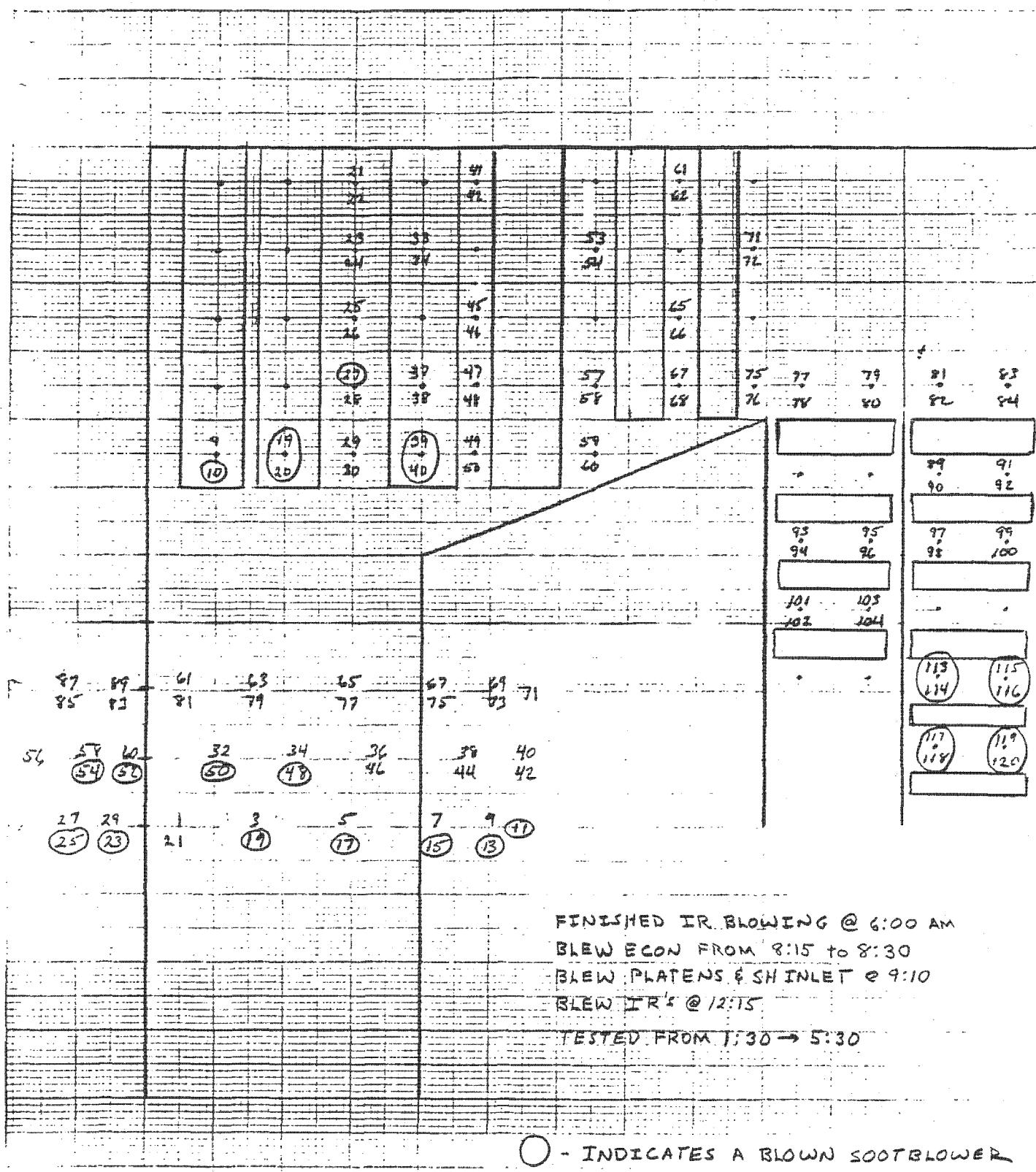
TEST # 1A BLOWING SEQUENCE

John

ATTACHMENT 1

IP14 000790

THE BABCOCK & WILCOX COMPANY



FINISHED IR BLOWING @ 6:00 AM

BLEW ECON FROM 8:15 to 8:30

BLEW PLATENS & SH INLET @ 9:10

BLEW IR'S @ 12:15

TESTED FROM 1:30 → 5:30

( ) - INDICATES A BLOWN SOOTBLOWER

IPP RB 615

SOOTBLOWER ARRANGEMENT

TEST 2A BLOWING SEQUENCE

JDR

6-8-66

IP14\_000791

# THE BABCOCK & WILCOX COMP.

BLEW EVERYTHING ENDING @ 7:50 AM  
BLEW ECON @ 8:30 → 9:00  
BLEW HORIZONTAL PRI & RH FROM 9:00 → 10:30  
BLEW PLATENS, SH INLET & ECON 10:30 → 12:30

TESTED FROM 1:15 → 5:15

TEPP RB 615

## SOOT BLOWER ARRANGEMENT

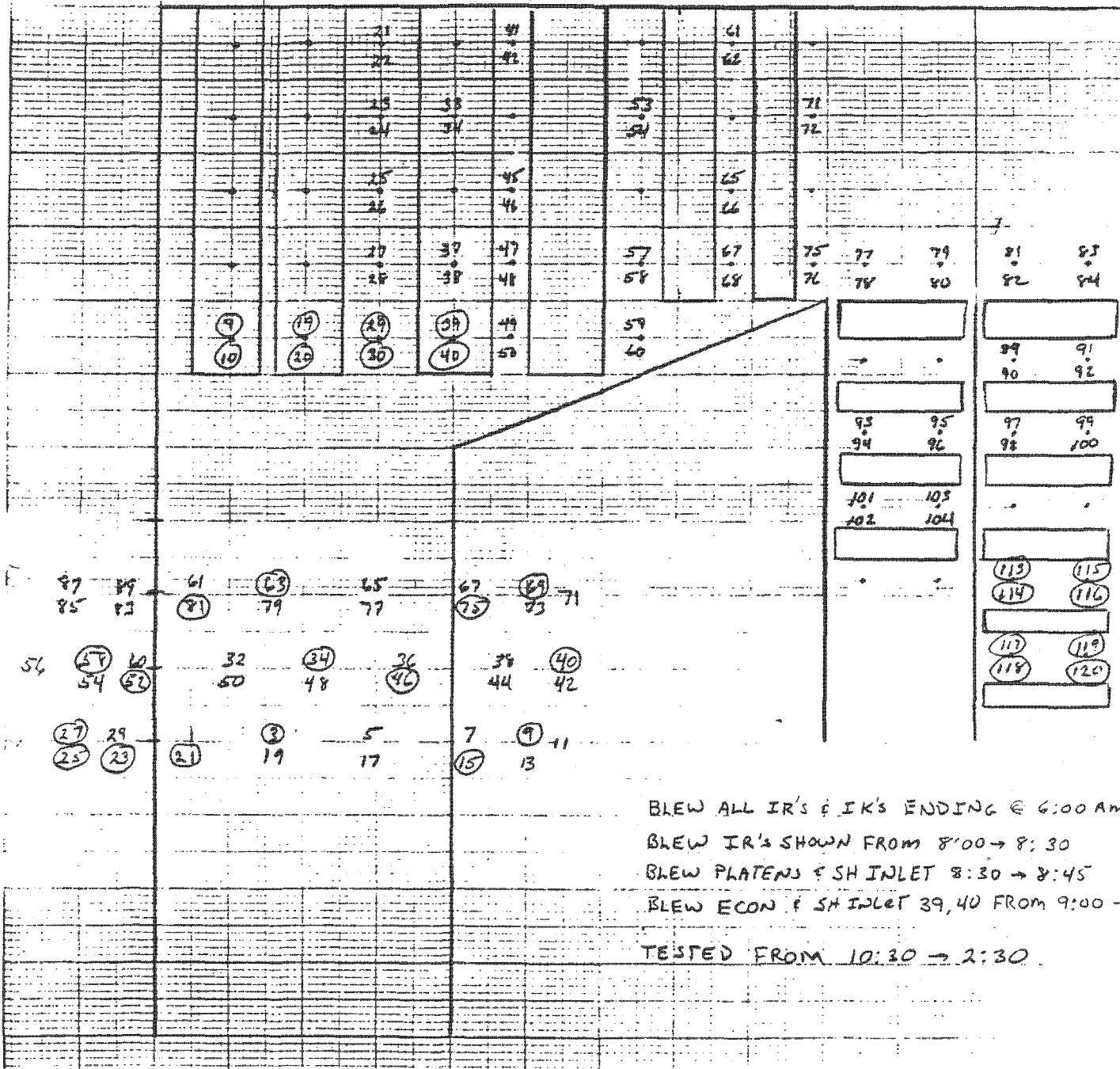
TEST #3A BLOWING SEQUENCE

三

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IP14 000792

THE BABCOCK & WILCOX COMPANY



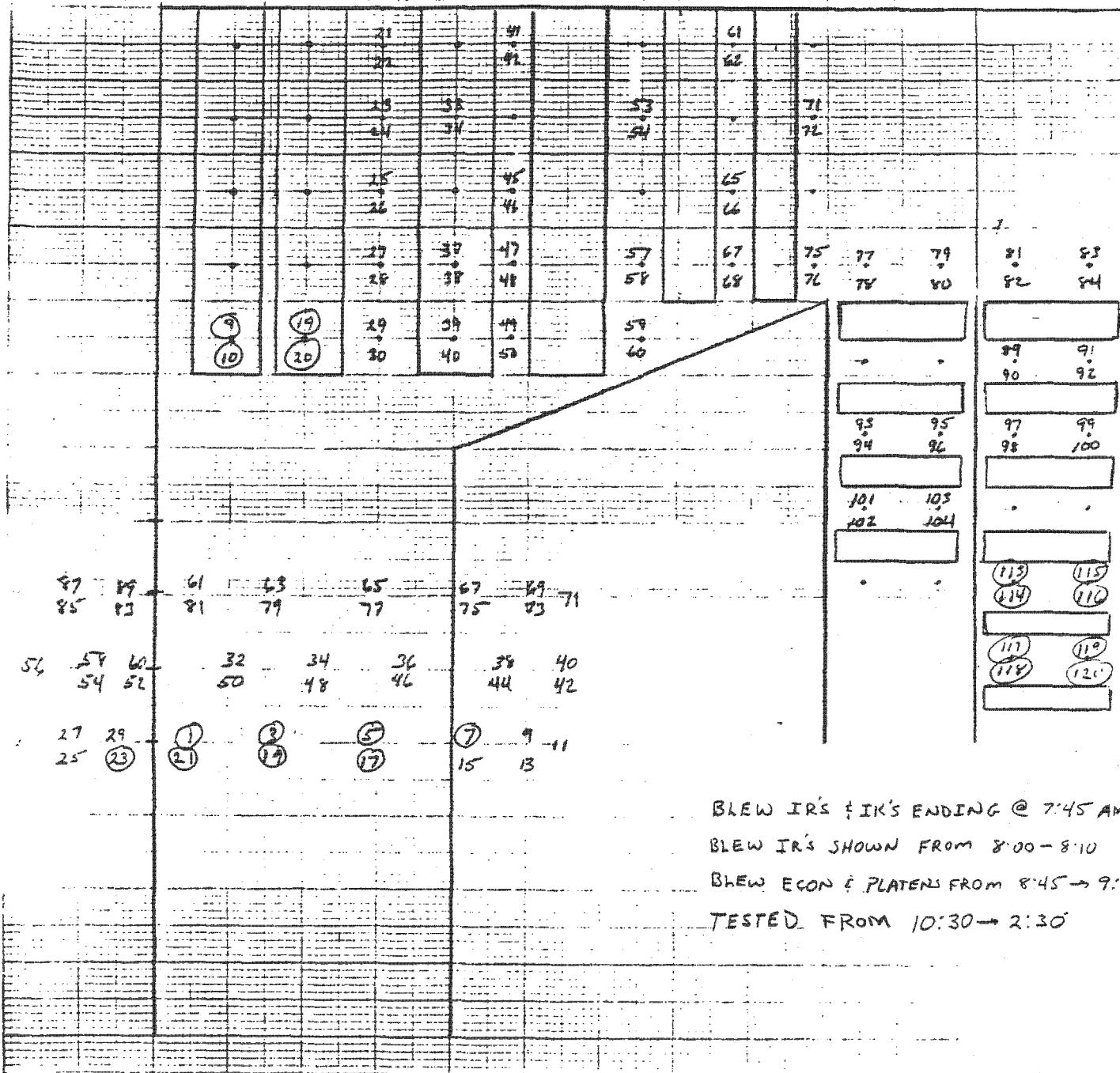
SW: IPP RB 615  
SOOTBLOWER ARRANGEMENT

TEST #4A BLOWING SCHEDULE

JDR  
6-8-88

IP14\_000793

THE BABCOCK & WILCOX COMPANY



BLEW IR'S & IK'S ENDING @ 7:45 AM

BLEW IR'S SHOWN FROM 8:00 - 8:10

BLEW ECON & PLATERS FROM 8:45 → 9:10

TESTED FROM 10:30 → 2:30

IPP RB 615

SOOT BLOWER ARRANGEMENT

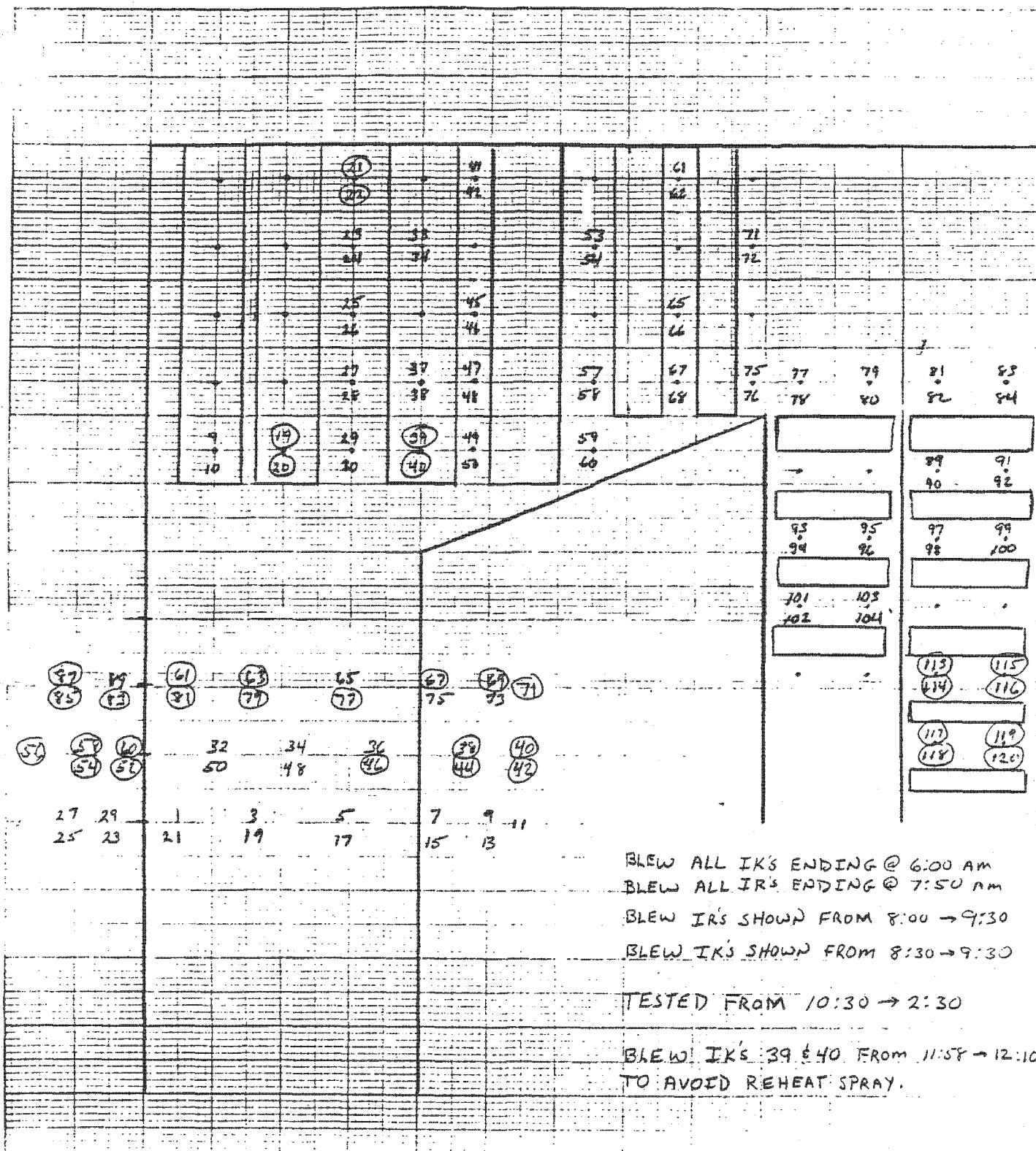
TEST #5A BLOWING SCHEDULE

JDR

6-8-86

IP14\_000794

THE BABCOCK & WILCOX COMPANY



TPP RB 615

## SOOTBLUNER ARRANGEMENT

TEST # 6A BLOWING SCHEDULE

三

6-8-2

IP14 000795